SONY

HD CAMERA CONTROL UNIT

HDCU-900

SD ANALOG INTERFACE UNIT
HKCU-901

HD ANALOG INTERFACE UNIT
HKCU-902

FRAME RATE CONVERTER UNIT
HKCU-903

LINE CONVERTER UNIT
HKCU-904

HDVS

MAINTENANCE MANUAL
1st Edition

⚠警告

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お客様が，このマニュアルに記載された設置や保守，点検，修理などを行うと感電や火災，人身事故につながることがあります。
危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

設置や保守，点検，修理などを行う前に，別冊のオペレーションマニュアルの「安全のために」とインストレーションアンドメンテナンスマニュアルの「安全のために」を必ずお読みください。

⚠ WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠ WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠ AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l’entretien. Afin de réduire les risques de décharge électrique, d’incendie ou de blessure n’effectuer que les réparations indiquées dans le mode d’emploi à moins d’être qualifié pour en effectuer d’autres. Pour toute réparation faire appel à une personne compétente uniquement.

HDCU-900 (UC)	Serial No. 10001 and Higher
HDCU-900 (J)	Serial No. 30001 and Higher
HDCU-900 (CE)	Serial No. 40001 and Higher
HKCU-901 (UC)	Serial No. 10001 and Higher
HKCU-901 (J)	Serial No. 30001 and Higher
HKCU-901 (CE)	Serial No. 40001 and Higher
HKCU-902 (SY)	Serial No. 10001 and Higher
HKCU-903 (SY)	Serial No. 10001 and Higher
HKCU-904 (SY)	Serial No. 10001 and Higher

Note

The cautions on this page are applied to HDCU-900.

Laser Diode Properties

Material	: In GaAsP
Wave length	: 1310 nm
Emission duration	: Pulse code modulation
Laser output power	: –8 dBm

CLASS 1
LASER PRODUCT

LASER KLASSE 1
PRODUKT

This camera control unit is classified as a CLASS 1 LASER PRODUCT.
The CLASS 1 LASER PRODUCT label is located on the rear panel.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer :

Check the metal trim, “metallized” knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 3.5 mA. Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers’ instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The “limit” indication is 5.25 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 20 V AC range are suitable. (See Fig. A)

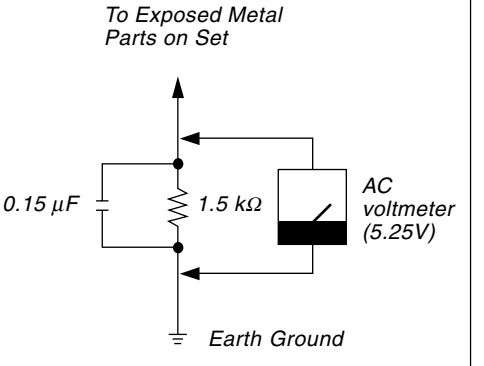

Fig A. Using an AC voltmeter to check AC leakage.

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Manual Structure

Purpose of this manual

This manual is the maintenance manual of the following models :

HD Camera Control Unit	HDCU-900
SD Analog Interface Unit	HKCU-901
HD Analog Interface Unit	HKCU-902
Frame Rate Converter Unit	HKCU-903
Line Converter Unit	HKCU-904

This manual is intended for use by trained system and service engineers, and describes the information regarding the circuit description, character display function, replacement of main parts and electrical alignment.

Related manuals

Beside this Maintenance Manual, the following manuals are available for the unit.

- **Operation Manual (Supplied with HDCU-900)**
  This manual describes how to operate the HDCU-900.

- **Installation and Maintenance Manual (Supplied with HDCU-900)**
  This manual intended for use by trained system and service engineers describes the information regarding the installation of the HDCU-900 and the information required for initial services.
  Part number: 3-204-285-0X

- **“Camera System HDC-900 Series Maintenance Manual” CD-ROM (Available on request)**
  This “Camera System HDC-900 Series Maintenance Manual” CD-ROM allows you to search for the detailed information (parts list, semiconductor pin assignments, block diagrams, schematic diagrams and board layouts) of the HD color camera HDC-900/950, that of HD camera control unit HDCU-900 and that of option board HKCU-901/902/903/904 for HDCU-900 that premises the service on the component level.
  In addition to the above-described information, you can view the PDF files of the related manuals of the equipment models that are used in the HDC-900 series camera system. (Contents are subject to change without notice.) For obtaining, contact your local Sony Sales Office/Service Center.

- **“Semiconductor Pin Assignments” CD-ROM (Available on request)**
  This “Semiconductor Pin Assignments” CD-ROM allows you to search for semiconductors used in Communication System Solutions Network Company equipment.
  Semiconductors that cannot be searched for on this CD-ROM are listed in the maintenance manual for the corresponding unit. The maintenance manual contains a complete list of all semiconductors and their ID Nos., and thus should be used together with the CD-ROM.
  Part number: 9-968-546-XX

Contents

The following is a summary of the sections of this manual.

Section 1 Service Overview

Describes information about circuit description, on-board indicators, adjustments after board replacement and character display functions.

Section 2 Replacement of Main Parts

Describes replacement of parts.

Section 3 Electrical Alignment

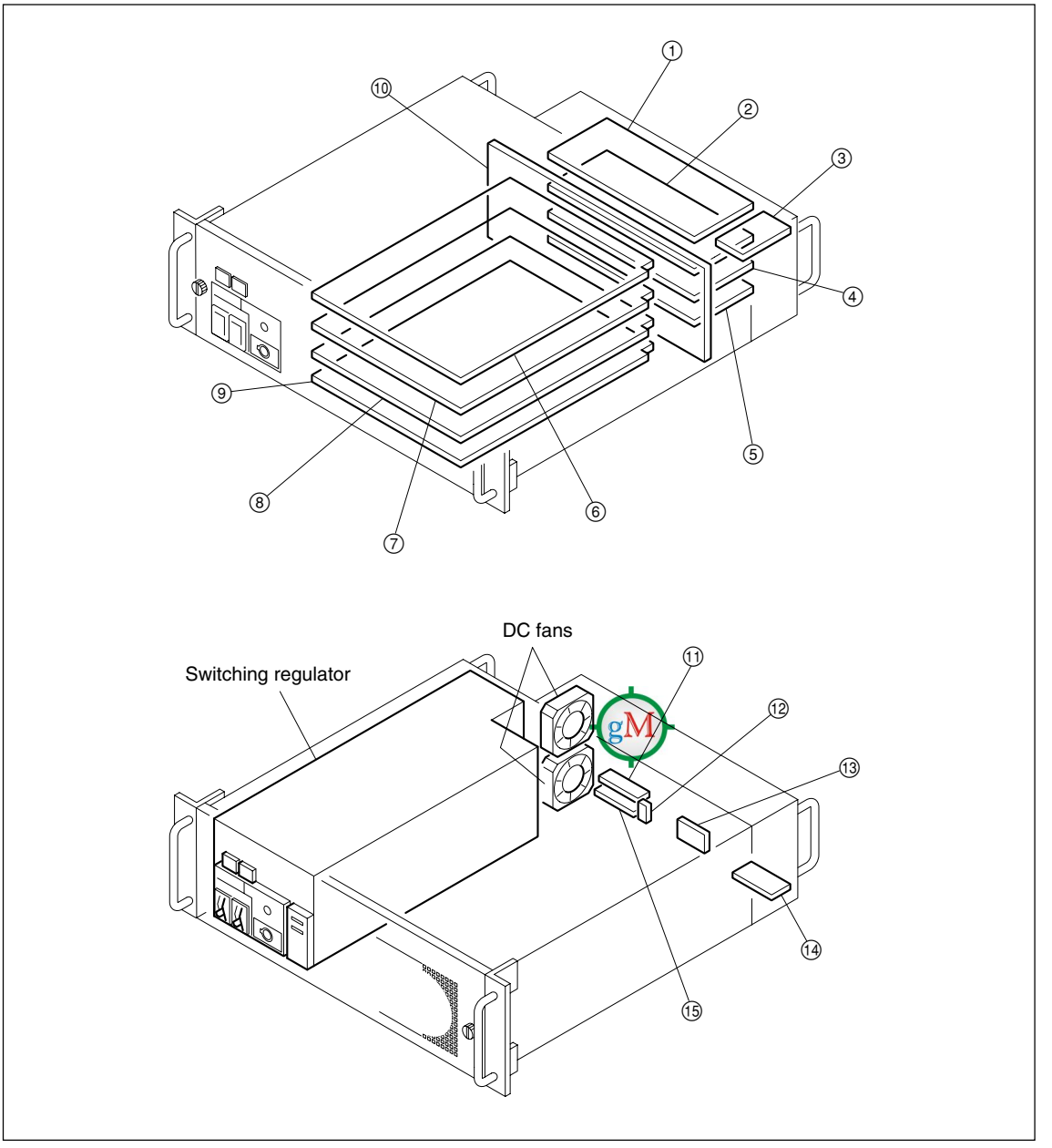
Describes the general information for electrical adjustment and the adjustment procedure of this unit.

Section 1
Service Overview

1-1. Tools

Name	Sony P/N	Remark
Extension board BKP-7900	–	Front extension board
Extension board JX-428	J-6394-280-A	Front extension board Used to check side B of the board.
Extension board EX-525A	A-8326-353-A	Rear side extension board
Extension board EX-738	A-8327-351-A	For HDC-900/950
Alignment sleeve remover HC-001	J-6480-010-A	For female connector
Cotton swab	–	Commercially available For cleaning optical contact block (4 mm or less in diameter)

1-2. Board/Main Parts Layout



No.	Board	Function
①	SDI-54A board (HDCU-900)	HD Digital Interface
②	DIF-102 board (HDCU-900)	SD Digital Interface
	ADA-59 board (HKCU-902)	HD Analog Interface
	SDI-54B board (HKCU-903)	HD Digital Interface
	SDI-54C board (HKCU-904)	HD Digital Interface
③	RX-53 board (HDCU-900)	Optical Interface
④	DIF-102 board (HDCU-900)	SD Digital Interface
	VDA-57 board (HKCU-901)	SD Analog Interface
	ADA-59 board (HKCU-902)	HD Analog Interface
	SDI-54C board (HKCU-904)	HD Digital Interface
⑤	PS-587 board (HDCU-900)	Power Supply
⑥	DPR-163 board (HDCU-900)	HD Video Processor
⑦	RC-86 board (HDCU-900)	HD-SD Down Converter
	FC-83 board (HKCU-903)	Frame Rate Converter
	LC-41 board (HKCU-904)	Line Converter
⑧	RC-86 board (HDCU-900)	HD-SD Down Converter
	IF-789A*1/789P*2 board (HKCU-901)	Composite Encoder
	LC-41 board (HKCU-904)	Line Converter
⑨	AT-141 board (HDCU-900)	Syscon/Audio Processor/SG
⑩	MB-902 board (HDCU-900)	Motherboard
⑪	CN-2004 board (HDCU-900)	Connector
⑫	CN-2006 board (HDCU-900)	Connector
⑬	CN-2007 board (HDCU-900)	Connector
⑭	CN-2008 board (HDCU-900)	Connector
⑮	CN-2005 board (HDCU-900)	Connector

*1 : For UC
*2 : For CE

Note

The slot to be used of each board differs depending on the used system. For details, refer to Section 2-1, “Setting the System Format” of the separate Installation and Maintenance Manual.

1-3. Circuit Description

1-3-1. HDCU-900

- **AT-141 board**

  The AT-141 board performs the various controls using the CPU, such as controlling the communication with the camera head, with the control panel and with the CNU, and the control of the respective circuit boards inside the CCU.
  The AT-141 board also performs the audio signal processing such as the D/A conversion of the MIC audio signal coming from the camera, the A/D conversion of the PGM signal, the A/D and D/A conversions of the INCOM audio, and the INCOM line switch with the external device. The AT-141 board also performs interface processing of the TALLY signal.
  The AT-141 board has an internal SG circuit for the HD and SD signal, establishes genlock between the HD and SD, and also genlocks the system with the main reference that is input from the external source.

- **PS-587 board**

  The PS-587 board is the power regulator that supplies +1.5 V and −2.0 V regulated powers that are used for processing the serial data of the HD and SDI systems.

- **RX-53 board**

  The RX-53 board is the interface board that has the function interface between the HD-SDI optical signal and the camera head. The RX-53 board also performs the O/E and E/O conversions.

- **DPR-163 board**

  The DPR-163 board interfaces the various signals with the camera head.
  As to the HD video signal, it performs the processing of the two HD video channels of both the camera picture and return picture. The processing includes the phase adjustment using the line memory and exchange of the clock signal with another desired clock.
  The DPR-163 board has a built-in color bar generator and performs the processing of the marker and skin gate for the monitor.
  It also performs embedding of the prompter signal into the signal of the return video signals and the interface processing with the digital audio system.

- **SDI-54A board**

  The SDI-54A board is an interface board for interfacing with the coaxial HD-SDI signal supplied from external equipment.
  It supplies the main line output signal, the monitor output signal and accepts the return (four systems) input, the main reference input and the prompter input.

- **RC-86 board**

  The RC-86 board performs the SD-conversion processing of the main line system HD signal and also performs the HD-conversion processing of the SD signal of the return system.
  As the interface with external equipment, it performs processing of the component SDI format signal.
  The RC-86 board has a built-in color bar generator and a simplified composite encoder. These are used to generate the composite analog signal for which the marker and skin gate processing has already been performed, which are the two types used for monitoring.

- **DIF-102 board**

  The DIF-102 board is an interface board used for interfacing the coaxial HD-SDI signal with external equipment.
  It accepts the SD-SDI main line output and the return (four systems) input, and also supplies the composite analog output signal to be connected to the picture monitor and has a waveform monitor control connector.
  In addition, it has a SYNC output of one channel that can be switched between HD-SYNC and SD-SYNC.

1-3-2. HKCU-901

- **IF-789A/789P board**

  The IF-789A/789P board is used in combination with the RC-86 board for interfacing the SD signal of the main line using an analog interface.
  It has a built-in digital composite encoder and color bar generator that are used to generate the composite output signal, the component output signal and the monitoring output. It also performs D/A conversion of these signals.
  It has a return signal processing block that converts the analog composite input signal into the 4:2:2 digital component signal and interfaces it with the RC-86 board.
  In addition, it has a built-in external sync circuit of the SC (sub-carrier).

- **VDA-57 board**

  The VDA-57 board is an interface board that interfaces the SD analog signal with external equipment. It supplies the composite and component SD analog signal, the monitor output, and SD-SYNC output, and accepts the return input signals (four systems).

1-3-3. HKCU-902

- **ADA-59 board**

  The ADA-59 board is not equipped with the corresponding front board as its pair. It performs the D/A and A/D conversions of the HD signal. This is the interface board with the external analog equipment. It accepts the component output of the two systems, monitor output and HD-SYNC output, and also supplies the return (single channel, four systems).

1-3-4. HKCU-903

- **FC-83 board**

  The FC-83 board is a frame conversion board that converts a 24P picture into a 60i picture using the 2 to 3 pull-down method.
  The FC-83 board has three built-in converter circuits in total (two circuits for the main output and for the circuit board in the bottom shelf of the main line system, and one conversion circuit for the return system picture). In the return system circuit, the return signal undergoes reverse-conversion of that of the main line signal.
  The board is equipped with a monitor output for outputting the signals that have already undergone the marker and skin gate processing to be used for monitoring.
  It also has an auxiliary reference input circuit for operating at multiple frame frequency. The auxiliary reference input circuit detects the frame sync point of both the main reference and sub reference signals, and establishes the frame lock of the sub reference signal with the main reference signal.

- **SDI-54B board**

  The SDI-54B board is an interface board that interfaces the coaxial HD-SDI signal with external equipment. It supplies the main line output signal and the monitor output signal. It accepts the return (four systems) input, sub reference input and supplies SYNC (two systems) output.

1-3-5. HKCU-904

- **LC-41 board**

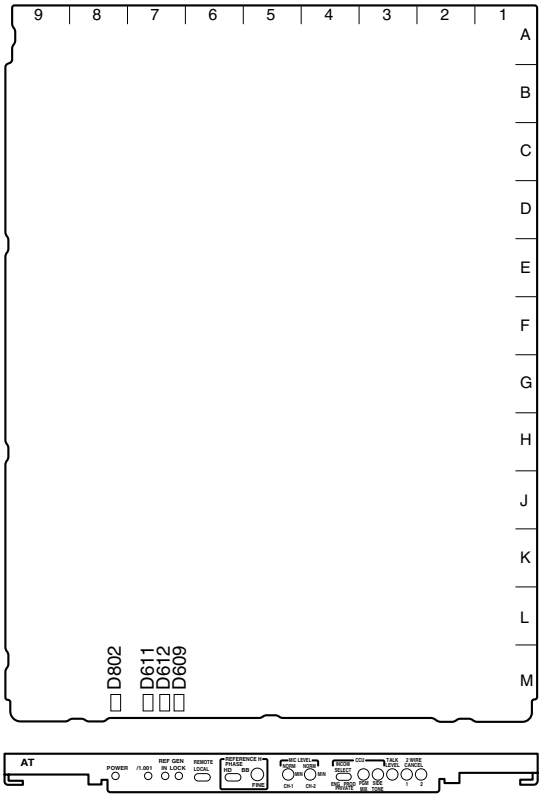
  The LC-41 board is a line conversion board that converts the 1080-60i or 540-60P picture into the 720-60P picture. It contains two converter circuits (for the main line system and return system). In the return system circuit, the return signal undergoes reverse-conversion of that of the main line signal.

- **SDI-54C board**

  The SDI-54C board is an interface board that interfaces the coaxial HD-SDI signal with external equipment. It supplies the main line output signal and the SYNC (two systems), and accepts the return (four systems) input.

1-4. Functions of the Indicators on the Boards

1-4-1. AT-141 Board



AT-141 board (A side and panel side)

D609 : GEN LOCK display

Lights up when external synchronization is established.

D611 : /1.001 display

Lights up when the frame frequency factor of the HD signal is set to 1/1.001 times.

Note

Set it with S603 on the AT-141 board. For details, refer to Section 1-5-1, “AT-141 Board” of “Settings of Switches and Controls on Boards” of the separate Installation and Maintenance Manual.

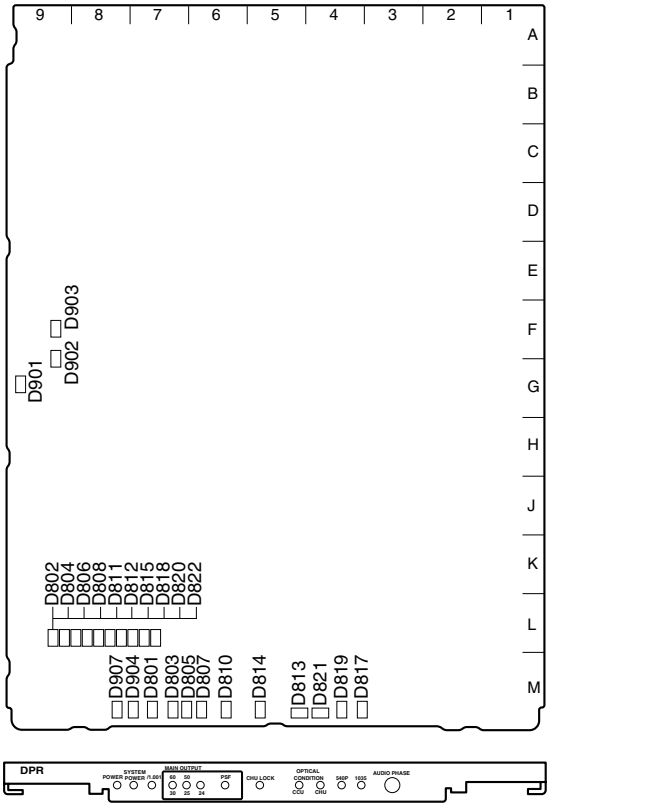
D612 : REF IN display

Lights up when the reference signal is input to the REFERENCE IN connector on the rear panel of the unit.

D802 : POWER display

Lights up when the voltage used on the board is normally supplied.

1-4-2. DPR-163 Board



DPR-163 board (A side and panel side)

Note

When D813 and D821 light in red, be sure to clean the CAMERA connector of the unit, the CCU connector of the camera side and optical/electrical cable. It is also recommended to clean them when the indicators light in yellow. For the cleaning procedure, refer to Section 1-7.

D801 : /1.001 display

Lights up when the frame frequency factor of the HD signal is set to 1/1.001 times.

Note

Set it with S603 on the AT-141 board. For details, refer to Section 1-5-1, “AT-141 Board” of “Settings of Switches and Controls on Boards” of the separate Installation and Maintenance Manual.

D802 : 0

Factory use only

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D803, D805, D807, D810 : MAIN OUTPUT display
Displays the frame frequency of the camera and the MAIN HD output of the CCU.
D803 lights up when the frequency is 30 Hz.
D805 lights up when the frequency is 25 Hz.
D807 lights up when the frequency is 24 Hz.
D810 lights up during progressive operation of the camera.

D804 : 1
Factory use only

D806 : 2
Factory use only

D808 : 3
Factory use only

D811 : 4
Factory use only

D812 : 5
Factory use only

D813 : OPTICAL CONDITION (CCU) display
Displays the optical level received at the HDCU-900 side. (0 dBm = 1 mW)
Lights in green : Normal (The optical reception level should be −17 dBm or more)
Lights in yellow : Normal (The optical reception level should be within −17 dBm to −20 dBm.)
Lights in red : Abnormal (The optical reception level should be less than −20 dBm.)

Note
Attenuates about 0.5 dB for every 1 km of cable.
Attenuates about 0.5 dB for each relay connector.

D814 : CHU LOCK display
Lights up when communication with the connected camera is normally established.

D815 : 6
Factory use only

D817 : 1035 line display
Lights up when the number of active video lines of the connected camera is 1035.

D818 : 7
Factory use only

D819 : 540P display
Lights up when the connected camera runs in 540P mode.

Note
Set it with S805 on the DPR-163 board. For details, refer to Section 1-5-2, “DPR-163 Board” of “Settings of Switches and Controls on Boards” of the separate Installation and Maintenance Manual.

D820 : 8
Factory use only

D821 : OPTICAL CONDITION (CHU) display
Displays the optical level received at the camera side. (0 dBm = 1 mW)
Lights in green : Normal (The optical reception level should be −17 dBm or more)
Lights in yellow : Normal (The optical reception level should be within −17 dBm to −20 dBm.)
Lights in red : Abnormal (The optical reception level should be less than −20 dBm.)

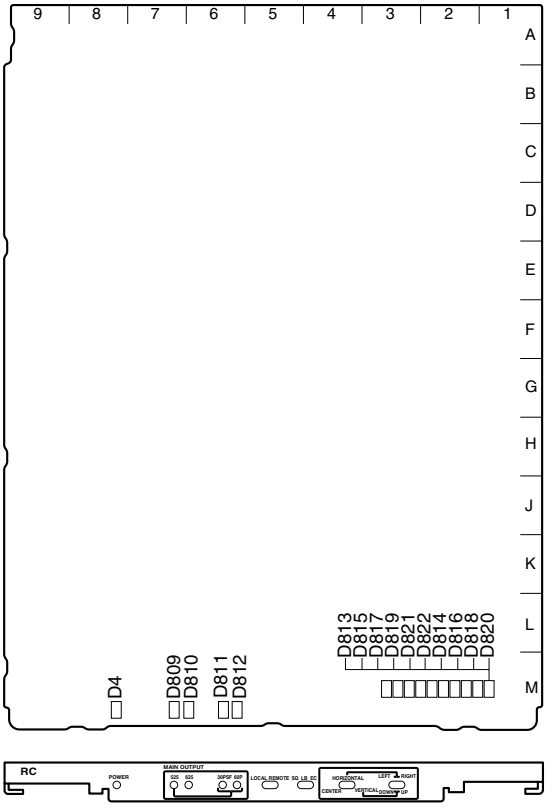
Note
Attenuates about 0.5 dB for every 1 km of cable.
Attenuates about 0.5 dB for each relay connector.

D822 : 9
Factory use only

D904 : SYSTEM POWER display
Lights when the power supply unit and power supply of the PS-587 board (1.5 V, −2V) are normal.

D907 : POWER display
Lights up when the voltage used on the board is normal.

1-4-3. RC-86 Board



RC-86 board (A side and panel side)

D4 : POWER display

Lights up when the voltage used on the board is normally supplied.

D809, D810, D811 : MAIN OUTPUT display

Displays the SD system.
D809 lights up when the SD system is set to 525/59.941 SDI.
D810 lights up when the SD system is set to 625/50I SDI.
D811 lights up during 30PsF operation of the camera.

Note

For details of the SD system setting, refer to Section 2-1-2, “SD System” of “Setting the System Format” of the separate Installation and Maintenance Manual.

D813 : 0

Factory use only

D814 : 6

Factory use only

D815 : 1

Factory use only

D816 : 7

Factory use only

D817 : 2

Factory use only

D818 : 8

Factory use only

D819 : 3

Factory use only

D820 : 9

Factory use only

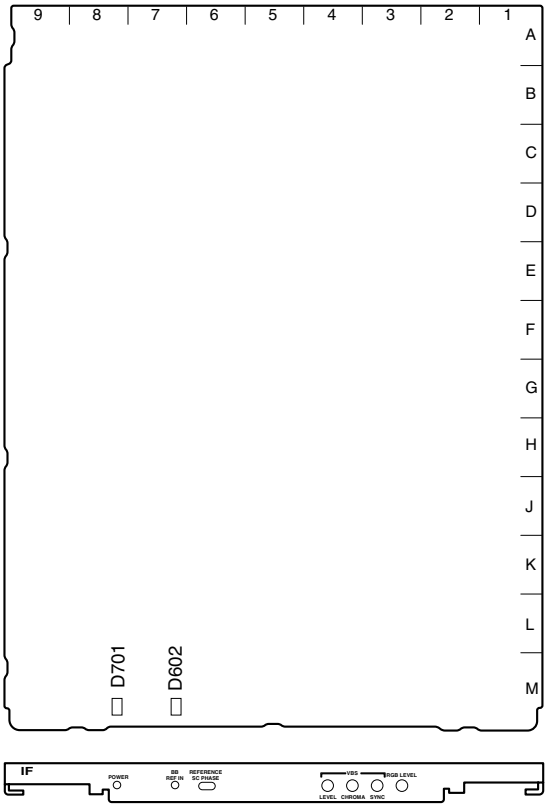
D821 : 4

Factory use only

D822 : 5

Factory use only

1-4-4. IF-789A/789P Board (HKCU-901)



IF-789A/789P board (A side and panel side)

D602 : BB REF IN display

Lights up when the external sync mode is set to SD and the reference signal for synchronizing the sub carrier is input.

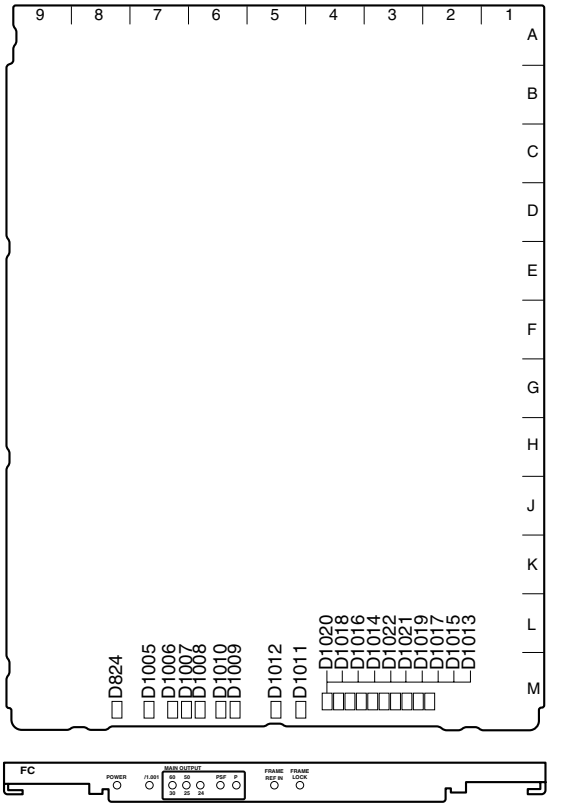
Note

Set it with S602 on the AT-141 board. For details, refer to Section 1-5-1, “AT-141 Board” of “Settings of Switches and Controls on Boards” of the separate Installation and Maintenance Manual.

D701 : POWER display

Lights up when the voltage used on the board is normally supplied.

1-4-5. FC-83 Board (HKCU-903)



FC-83 board (A side and panel side)

D824 : POWER display

Lights up when the voltage used on the board is normally supplied.

D1005 : /1.001 display

Lights up when the frame frequency factor of the HD signal is set to 1/1.001 times.

Note

Set it with S603 on the AT-141 board. For details, refer to Section 1-5-1, “AT-141 Board” of “Settings of Switches and Controls on Boards” of the separate Installation and Maintenance Manual.

D1006, D1007, D1008, D1009, D1010 : MAIN OUTPUT display

Displays the frame frequency setting of the frame convert HD output of the CCU.
D1006 lights up when the frequency is 30 Hz.
D1007 lights up when the frequency is 25 Hz.
D1008 lights up when the frequency is 24 Hz.
D1009 lights up when the picture of the HD output is progressive and the format is PsF (segment progressive).
D1010 lights up when the picture of the HD output is progressive and the format is P (pure progressive).

Note

Set it with S2 on the FC-83 board. For details, refer to Section 1-5-5, “FC-83 Board” of “Settings of Switches and Controls on Boards” of the separate Installation and Maintenance Manual.

D1011 : FRAME LOCK display

Lights up when the frame phase of the main reference and sub reference is detected normally.

D1012 : FRAME REF IN display

Lights up when the sub reference for frame lock is input.

D1013 : 0

Factory use only

D1014 : 6

Factory use only

D1015 : 1

Factory use only

D1016 : 7

Factory use only

D1017 : 2

Factory use only

D1018 : 8

Factory use only

D1019 : 3

Factory use only

D1020 : 9

Factory use only

D1021 : 4

Factory use only

D1022 : 5

Factory use only

1-5. Adjustment and Setting after Replacing the Boards

After replacing each plug-in board, return the switches to the setting before replacement. Also, readjust and reset the following items.

1-5-1. When Replacing the AT-141 Board

While referring to Section 2, “System Setup” of the separate Installation and Maintenance Manual, readjust and reset the following items.

Adjustment and setting items

2-2-1. Setting the Intercom System
- Selecting the intercom system
- Setting the input level of the PGM audio signal
- Selecting an intercom line to be connected to the INTERCOM connector

2-2-2. Setting the Microphone
- Controlling the microphone input level from the remote control
- Adjusting the microphone input level using the MIC LEVEL switch
- Setting the microphone output level

2-3-1. Setting the Tally System

2-3-2. Setting the Camera Number

2-4-2. Adjusting the Signal Phase
- Adjusting the sync signal phase

1-5-2. When Replacing the DPR-69 Board

While referring to Section 2, “System Setup” of the separate Installation and Maintenance Manual, readjust and reset the following items.

Adjustment and setting items

2-4-4. Adjusting the Level of Signals for Waveform Monitor
- Adjusting the staircase signal

If required, adjust the following items too.

2-4-4. Adjusting the Level of Signals for Waveform Monitor
- Adjusting the WF Output Signal Level

2-4-5. Adjusting the Level of Signals for Picture Monitor

1-5-3. When Replacing the DPR-163 Board

While referring to Section 3, “Electrical Alignment”, adjust the following item.

Adjustment item

3-3-3. Prompter Level Adjustment

1-5-4. When Replacing the IF-789A/789P Board (HKCU-901)

While referring to Section 3, “Electrical Alignment”, adjust the following items.

Adjustment items

3-5-4. GRB Output Level Adjustment

3-5-6. Return Level Adjustment

While referring to Section 2, “System Setup” of the separate Installation and Maintenance Manual, adjust the following item.

Adjustment item

2-4-3. Level Adjustment of the VBS Signal

1-6. Connecting/Disconnecting the Flexible Card Wire

The flexible card wire is used to connect between the following boards. Bending the flexible card wire may result in shortening the lifespan. Be careful not to bend it.

- Between the CN-2004 and PS-587 boards 1 wire
- Between the CN-2005 and PS-587 boards 1 wire
- Between the CN-2006 and PS-587 boards 1 wire
- Between the CN-2007 and PS-587 boards 1 wire
- Between the CN-2008 and PS-587 boards 1 wire

Disconnecting

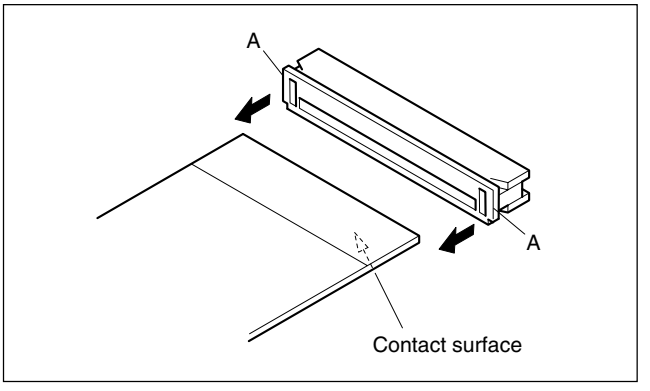
1. Turn off the main power.
2. Slide portion A in the direction of the arrow to unlock and pull out the flexible card wire.

Connecting

Notes

- Do not insert the flexible card wire sideways.
- Confirm that there is no stain or dust on the contact surface of the flexible card wire.

1. Slide portion A in the direction of the arrow, turn over the contact surface of the flexible card wire, then securely insert it into the connector.
2. Return portion A to its original position and lock the connector.



1-7. Cleaning of Connector/Cable

The state of the optical connector while the receptor is receiving signals can be checked using the indicators on the DPR-163 board. (For details, refer to Section 1-4-2, “DPR-163 Board” of “Functions of the Indicators on the Boards”)
When the relevant indicator lights in red or yellow, clean the following optical contact blocks.

- CAMERA connector of the unit
- CCU connector of the camera side
- Optical/electrical cable
- Connection connector of RX-53 board

When replacing the CAMERA connector or replacing the RX-53 board assembly, cleaning is also required.
Follow the procedures below for cleaning.

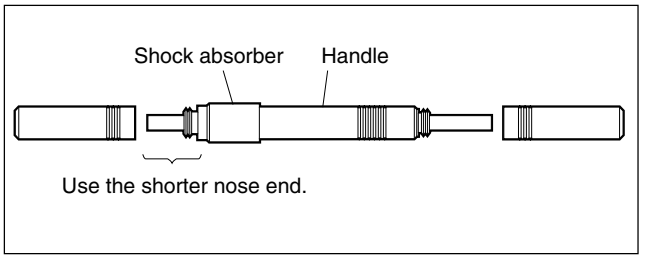
Tools Required

- Alignment sleeve remover HC-001
  (for female connector)
  Sony P/N : J-6480-010-A

Note

Insert the shorter nose end when removing/installing the alignment sleeve.
Grasp not the shock absorber portion of the remover but the handle in use.

- Cotton swabs (commercially available)



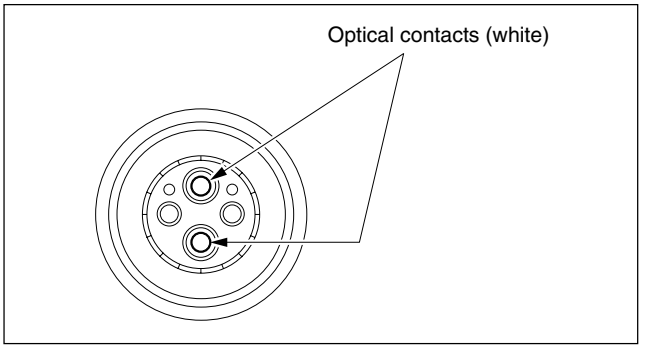
Note

Use a cotton swab whose diameter is about 4 mm.
If a cotton swab whose diameter exceeds 5 mm is used, the cotton swab cannot be inserted into the end of the connector and the tip of the optical contact cannot be cleaned.

Cleaning

Male connector

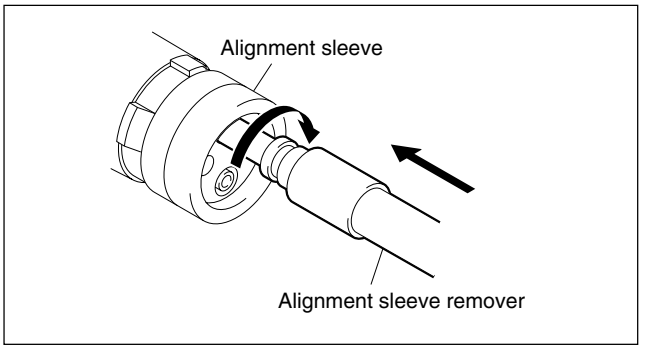
Clean the tip of the white optical contacts by a cotton swab moistened with alcohol.



Female connector

The optical contacts for female connector are in an unexposed state. In cleaning, it is necessary to be exposed by removing the alignment sleeve in advance. Proceed as follows.

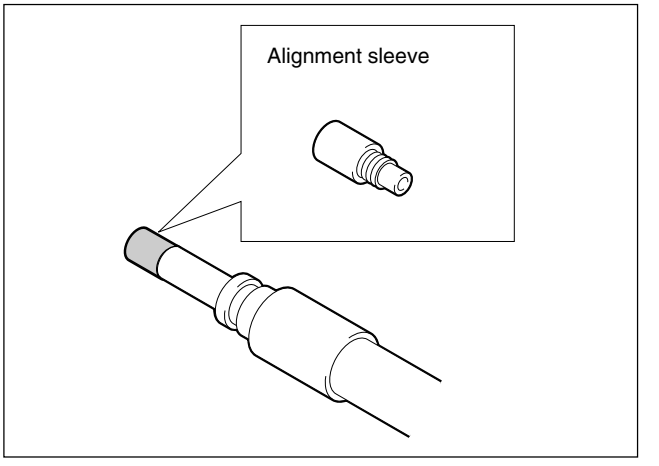
1. Insert the alignment sleeve remover into the alignment sleeve in the straight line and turn it clockwise.



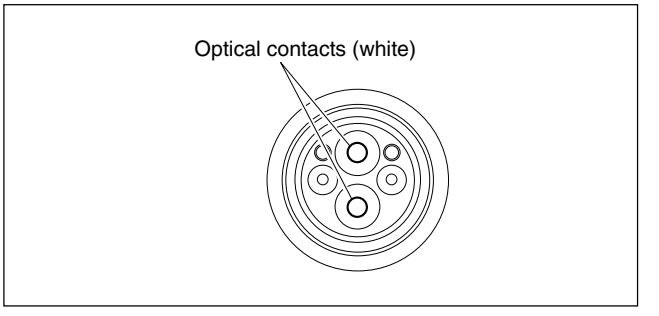
2. When the turn stops, pull out the remover in the straight line forcedly.

Note

The alignment sleeve can be removed/reinstalled with the sleeve itself attached to the tip of the remover. Great care should be taken so as not to lose or damage the alignment sleeve.
(Alignment sleeve: Sony P/N 9-980-074-01)



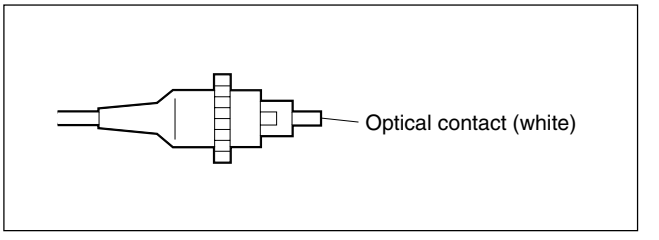
3. Clean the tip of the white optical contacts by a cotton swab moistened with alcohol.



4. Insert the remover with the alignment sleeve attached to its tip, and push it until it clicks.
5. Rotate the remover counterclockwise to install the alignment sleeve, and extract the remover.

Connection connector

Clean the optical contact block of the connector using a cotton swab moistened with alcohol.



1-8. Notes for Service

1-8-1. Notes for RX-53 Boards

The electric parts mounted on the RX-53 board cannot be replaced or adjusted.
If the electric parts need to be replaced or adjusted, replace the entire unit.

1-8-2. Circuit Protective Elements

The positive characteristic thermistor (for power supply) functions as a circuit protective element on the AT-141, DPR-163, RC-86, IF-789A/789P (HKCU-901), FC-83 (HKCU-903) and LC-41 (HKCU-904) boards of the unit. The thermistor increases the internal resistance and limits the current flowing to the circuits when an overcurrent flows or when the ambient temperature increases and the element reaches the specified temperature. If the elements operates, turn off the main power and inspect the HDCU internal circuit. After removing the cause of the equipment abnormality and the temperature of the element decreases, turn on the power again and operate the unit correctly. It takes about 1 minute for the elements to cool down after the main power is turned off.

Board	Ref. No.	Address	Protective circuit/equipment
AT-141	THP800	A9	Circuit inside the board
	THP801	B8	
	THP802	B4	
DPR-163	THP901	G9	Circuit inside the board
	THP902	F9	
	THP903	K1	
RC-86	THP1	B9	Circuit inside the board
	THP2	B9	
IF-789A/789P (HKCU-901)	THP701	A9	Circuit inside the board
FC-83 (HKCU-903)	THP821	B8	Circuit inside the board
LC-41 (HKCU-904)	THP601	B8	Circuit inside the board

1-8-3. Notes on Repair Parts

1. Safety Related Components Warning

WARNING

Components marked ⚠ are critical to safe operation. Therefore, specified parts should be used in the case of replacement.

2. Standardization of Parts

Some repair parts supplied by Sony differ from those used for the unit. These are because of parts commonality and improvement.
Parts list has the present standardized repair parts.

3. Stock of Parts

Parts marked with “o” at SP (Supply Code) column of the spare parts list may not be stocked. Therefore, the delivery date will be delayed.

4. Harness

Harnesses with no part number are not registered as spare parts.
In need of repair, get components shown in the list and repair using them.

5. Destination Representation

The part indicated “For J/UC/CE” in the spare parts list is used in the unit written below.
For J : The part is used in a unit for Japan.
For UC : The part is used in a unit for the U.S.A. and Canada.
For CE : The part is used in a unit for regions except the above countries.

1-9. Character Display Function

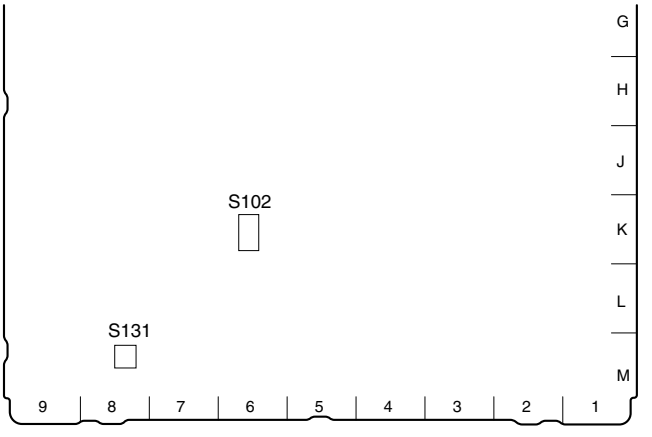
The character generation circuit built into the unit can mix character information such as the settings, state and self-diagnosis of the unit with the SD video signal, output it from the PIX OUT (RC-86 board output) and CHARACTER OUTPUT connectors, and display it on the SD analog monitor.
The character MIX function output from the PIX OUT connector can be forcibly turned off by turning off the S102-5 switch on the AT-141 board.
When the SD analog monitor is connected to the CHARACTER OUT connector, only characters are displayed in black and white.

Operating procedure

To display the setting, state and self-diagnosis display of the unit on the SD analog monitor, press the CHARACTER button of the RCP so that the button lights.
To change the page, press the CHARACTER button of the RCP. The page can also be changed by pressing the S131 switch on the AT-141 board.
When the CHARACTER button of the RCP is kept pressed, the pages are changed continuously. After all the pages are displayed, the cycling display stops on the final page and the CHARACTER button of the RCP goes off.
To display the character information again, press the CHARACTER button of the RCP.

Note

The first page is blank. When selecting the first page, the display of characters is OFF.



AT-141 board (A side)

The contents of the pages displayed on the SD analog monitor are as follows.

Page	Title
0	Display OFF (CHARACTER button OFF)
1	System Status
2	Auto & Diag
3	Camera Status
4	SD Signal Status
5	System Diag 1/3
6	System Diag 2/3
7	System Diag 3/3
8	AT Diag
9	DPR Diag
10	Slot-2 Diag
11	Slot-3 Diag
12	Camera Diag
13	ROM Version

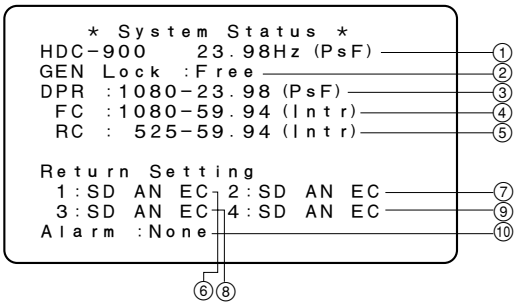
Required equipment

- Color monitor
  Sony BVM-1911/2811 or equivalent (for NTSC)
  Sony BVM-2011P/3011P or equivalent (for PAL)
- Remote control unit
  Sony RCP-700 series
- HDVS camera system
  HDC-900/950

http://getMANUAL.com

Page 1

System Status Display

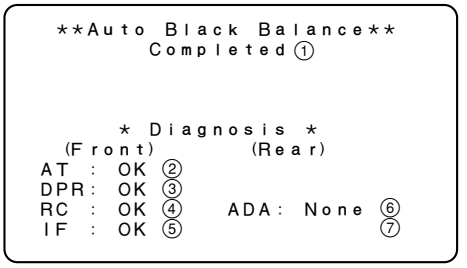


No.	Contents
①	Displays the type of camera connected to the unit. (HDC-700/HDC-750/HDC-900/HDC-950/UNDEFINED)
②	Displays the type of external sync signal. (Free/SD Digital/HD Digital)
③	Displays the setup format of the DPR-163 board.*1
④	Displays the setup format of the board mounted in the second slot from the top of the front side.*1
⑤	Displays the setup format of the board mounted in the third slot from the top of the front side.*1
⑥	Displays the type of signal input to the RET INPUT 1 connector on the rear panel of the unit.
⑦	Displays the type of signal input to the RET INPUT 2 connector on the rear panel of the unit.
⑧	Displays the type of signal input to the RET INPUT 3 connector on the rear panel of the unit.
⑨	Displays the type of signal input to the RET INPUT 4 connector on the rear panel of the unit.
⑩	Displays abnormal portions of the system detected during self-diagnosis.

*1 : For details, refer to Section 2, “System Setup” of the separate Installation and Maintenance Manual.

Page 2

Auto & Diag Display

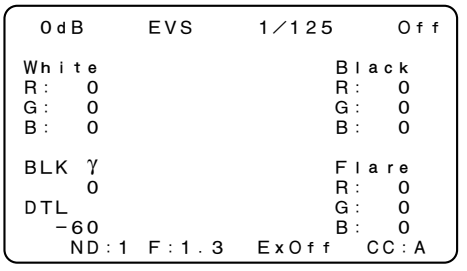


No.	Contents
①	Displays the progress of auto setup of the camera side.
②	Displays the self-diagnosis result of the AT-141 board (OK/NG).*2
③	Displays the self-diagnosis result of the DPR-163 board (OK/NG).*2
④	Displays the self-diagnosis result of the board mounted in the second slot from the top of the front side (OK/NG).*2
⑤	Displays the self-diagnosis result of the board mounted in the third slot from the top of the front side (OK/NG).*2
⑥	Displays the self-diagnosis result of the board mounted in the second slot from the top of the rear side (OK/NG).*2
⑦	Displays the self-diagnosis result of the board mounted in the third slot from the top of the rear side (OK/NG).*2

*2 : For the contents of the self-diagnosis of each board, refer to pages 8 through 11 of the character display.

Page 3

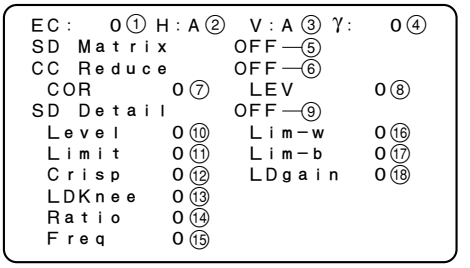
Camera Status Display



Contents
Displays information of GAIN, ND, CC, Extender, Shutter, aperture, Write, Black, Flare, Blackγ, Detail, etc.

Page 4

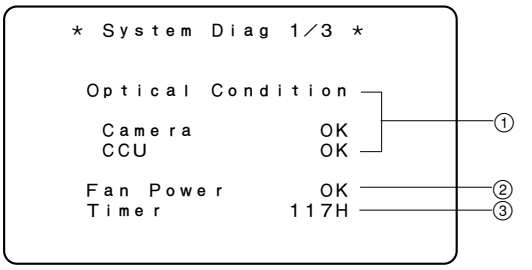
SD Signal Status Display



No.	Contents
①	Setting state of the aspect ratio of the SD signal (SQ/LB/EC) SQ : Squeeze LB : Letter box EC : Edge crop Displays the crop position too. (–99 to 99) –99 : The cut-out position is in the leftmost position. 0 : Cuts out the center. 99 : The cut-out position is in the rightmost position.
②	Setting state of the H down-converter interpolation filter coefficient (A to E)
③	Setting state of the V down-converter interpolation filter coefficient (A to E)
④	Setting state of SD GAMMA (–99 to 99)
⑤	Setting state of the linear matrix correction coefficient (ON/OFF)
⑥	Setting state of the cross-color reducing function (ON/OFF)
⑦	Setting state of the coring level of the cross-color reducing (–99 to 99)
⑧	Setting state of the reducing level of the cross-color reducing (–99 to 99)
⑨	Setting state of the detail function (ON/OFF)
⑩	Setting state of the detail level (–99 to 99)
⑪	Setting state of the detail limiter (–99 to 99)
⑫	Setting state of the detail crispening (–99 to 99)
⑬	Setting state of the level dependent knee (–99 to 99)
⑭	Setting state of the detail H/V ratio (–99 to 99)
⑮	Setting state of the detail boost frequency (–99 to 99)
⑯	Setting state of the detail white limiter (–99 to 99)
⑰	Setting state of the detail black limiter (–99 to 99)
⑱	Setting state of the level dependent gain (–99 to 99)

Page 5

System Diag (1/3) Display

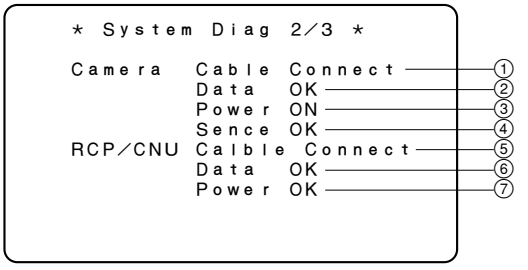


No.	Contents
①	State of the optical receiving level of the camera and camera control unit (OK/WARNING/NG)*3 WARNING : The optical level is –17 to –20 dBm. NG : The state when the optical level is low and any signal waveform cannot be obtained When either of WARNING or NG appears on the CCU side, clean the connector or cable while referring to Section 1-7. When either of WARNING or NG appears on the camera side, clean the connector or cable while referring to the Maintenances Manual of the camera.
②	State of the fan of the power supply block and the fan of the rear panel (OK/NG) NG : The fan of the switching regulator and the fan of the rear panel are defective.
③	Accumulated power supply time to the AT-141 board is displayed.

*3 : The optical sending/receiving state of the main unit also can be checked using the indicator on the panel of the DPR-163 board. For details, refer to Section 1-4-2, “DPR-163 Board” of “Functions of the Indicators on the Boards”.

Page 6

System Diag (2/3) Display

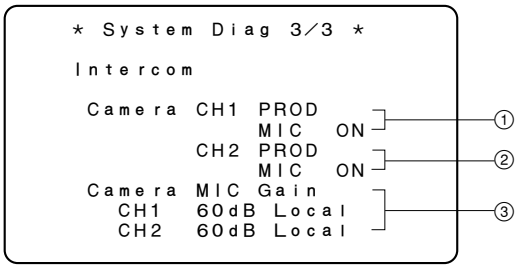


No.	Contents
①	State of camera cable connection (Open/Short/NG)
②	Existence of data from the camera (−−/Wait/Sence/OK) −− : The communication with the camera cannot be established. Wait : The communication with the camera is being waited. Sence : The communication with the camera is being established.
③	State of the power supply of the camera (ON/OFF)
④	State of connection to the camera (OK/NG*4)
⑤	State of cable connection of the RCP/CNU connector of the rear panel of the unit (Open/Connect)
⑥	Existence of the data from the RCP/CNU connector of the rear panel of the unit (−−/Wait/Sence/OK) −− : The communication with the equipment connected to the RCP/CNU connector cannot be established. Wait : The communication with the equipment connected to the RCP/CNU connector is being waited. Sence : The communication with the equipment connected to the RCP/CNU connector is being established.
⑦	State of the power supply of the RCP/CNU connector of the rear panel of the unit (OK/NG)

*4 : When power of the camera is supplied from the outside too, NG appears.

Page 7

System Diag (3/3) Display

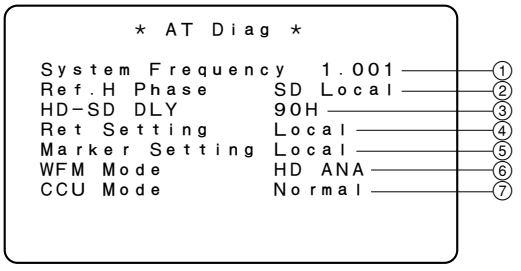


No.	Contents
①	Setting state of the intercom 1ch of the camera side (ENG/PROD)
②	Setting state of the intercom 2ch of the camera side (ENG/PROD)
③	Gain and control state of the microphone circuit of the camera side (Remote/Local)

Page 8

AT Diag Display

Displays the details of self-diagnosis of the AT-141 board of the unit.



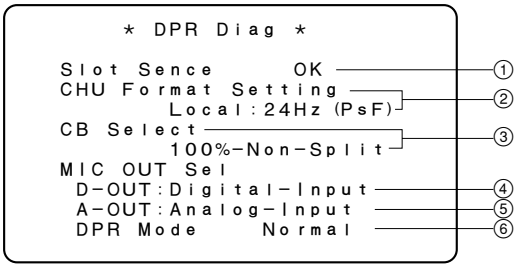
No.	Contents
①	Setting state of the S603 switch on the AT-141 board (1.001/1.000)*5
②	Setting state of the S601 and S602 switches on the AT-141 board (SD Local/SD Remote/HD Local/HD Remote)*5
③	Setting state of delay amount (setting of the S120 switch on the AT-141 board) when converting the format of the HD-SDI signal (1Frame/90H)*5
④	Setting state of the S110 switch on the AT-141 board (Local/Remote) *5
⑤	Setting state of the S111 switch on the AT-141 board (Local/Remote) *5
⑥	Setting state of the S103-4 switch on the AT-141 board (Recall/HD ANA)*5
⑦	State of the operation mode of the AT-141 board (Normal/Test)

*5 : For details, refer to Section 1-5-1, “AT-141 Board” of “Settings of Switches and Controls on Boards” of the separate Installation and Maintenance Manual.

Page 9

DPR Diag Display

Displays the details of self-diagnosis of the DPR-163 board of the unit.



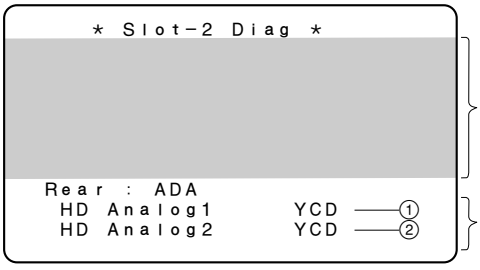
No.	Contents
①	Whether the DPR-163 board is recognized (None/NG/OK)
②	Setting state of the S804 to S807 switches on the DPR-163 board*6
③	Setting state of the S810 switch on the DPR-163 board*6
④	Setting of input signal that is output to DIGITAL AUDIO OUT (Digital-Input/Analog-Input)
⑤	Setting of input signal that is output to ANALOG AUDIO OUT (Digital-Input/Analog-Input)
⑥	State of the operation mode of the DPR-163 board (Normal/Test)

*6 : For details, refer to Section 1-5-2, “DPR-163 Board” of “Settings of Switches and Controls on Boards” of the separate Installation and Maintenance Manual.

Pages 10 and 11

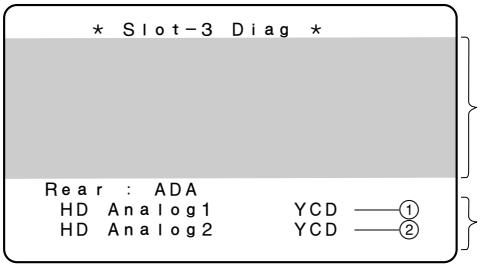
Slot-2 Diag/Slot-3 Diag Display

Displays the details of self-diagnosis of the board mounted in the second or third slot from the top of the front/rear side of the unit.



Dialog display of the board mounted in the second slot from the top of the front side. (Refer to the next page “a” through “d”.)

Displays the details of self-diagnosis of the ADA-59 board. (This is not displayed when a board other than the ADA-59 board is mounted.)



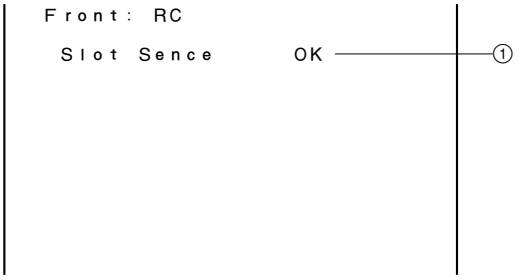
Dialog display of the board mounted in the third slot from the top of the front side. (Refer to the next page “a” through “d”.)

Displays the details of self-diagnosis of the ADA-59 board. (This is not displayed when a board other than the ADA-59 board is mounted.)

No.	Contents
①	Setting state of switch S103-1 on the AT-141 board (YCD/RGB)*7
②	Setting state of switch S103-2 on the AT-141 board (YCD/RGB)*7

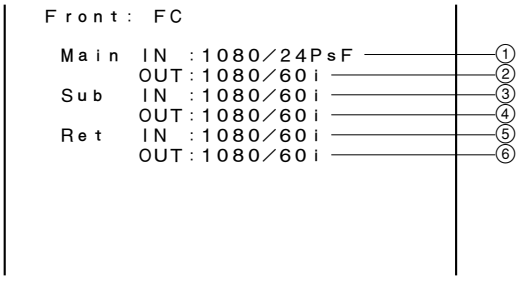
*7 : For details, refer to Section 1-5-1, “AT-141 Board” of “Settings of Switches and Controls on Boards” of the separate Installation and Maintenance Manual.

a. When the RC-86 board is mounted in the second or third slot from the top of the front side of the unit



No.	Contents
①	Whether the RC-86 board is recognized (None/NG/OK)

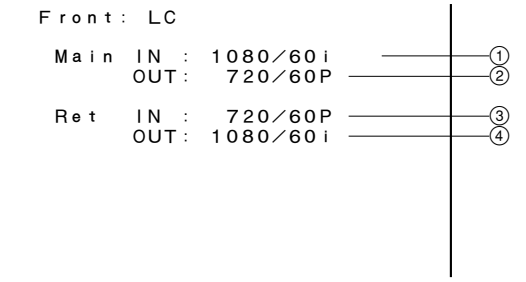
b. When the FC-83 board is mounted in the second slot from the top of the front side of the unit



No.	Contents
①	State of the format of the frame converter MAIN INPUT signal
②	Setting state of the conversion format (setting of S2/S3 on the FC-83 board)*7 of the frame converter MAIN OUTPUT signal
③	State of the format of the frame converter SUB INPUT signal
④	State of the conversion format of the frame converter SUB OUTPUT signal
⑤	Setting state of the format (setting of S11 to S13 on the FC-83 board)*7 of the RETURN VIDEO signal to be input to the FC-83 board
⑥	State of the format of the RETURN VIDEO signal to be output from the FC-83 board

*7 : For details, refer to Section 1-5-5, “FC-83 Board” of “Settings of Switches and Controls on Boards” of the separate Installation and Maintenance Manual.

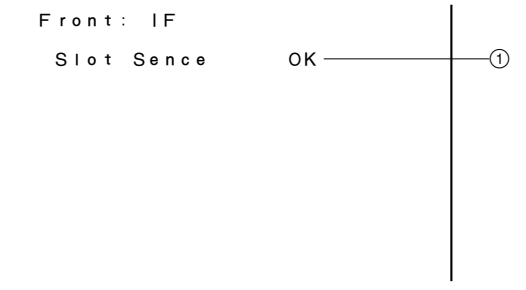
c. When the LC-41 board is mounted in the second or third slot from the top of the front side of the unit



No.	Contents
①	State of the format of the line converter MAIN INPUT signal
②	Setting state of the conversion format (setting of S2 on the LC-41 board)*8 of the line converter MAIN OUTPUT signal
③	Setting state of the format (setting of S11 and S12 on the LC-41 board)*8 of the RETURN VIDEO signal to be input to the LC-41 board
④	State of the format of the RETURN VIDEO signal to be output from the LC-41 board

*8 : For details, refer to Section 1-5-6, “LC-41 Board” of “Settings of Switches and Controls on Boards” of the separate Installation and Maintenance Manual.

d. When the IF-789A/789P board is mounted in the third slot from the top of the front side of the unit



No.	Contents
①	Whether the IF-789A/789P board is recognized (None/NG/OK)

Page 12

Camera Diag Display

HDC-700 SERIES

```
      * CAMERA Diag *

   (CHU)              (ADP)

  VA:  OK          VD  :  OK
  MX:  OK          AU  :  OK
  PR:  OK          DAP:  OK
  DL:  OK
  IE:  OK
```

HDC-900 SERIES

```
      * CAMERA Diag *

  OHB:  OK          DAP:  OK
  VDA:  OK          VA  :  OK
  DAD:  OK          AT  :  OK
  AU  :  OK
  SG  :  OK
  DPR:  OK
  SDI:  OK
```

Contents
Displays the self-diagnosis result of the board on the camera side that is sent from the camera by the Diag command without change.

Page 13

ROM Version (HDC-700 Series) Display

Displays the ROM versions of the unit and the peripheral equipment of the unit.

```
      * ROM Version *

  CHU     4.10        99.07.22  ①
  ADP     4.10        99.07.14  ②
  CCU     3.04        98.08.11  ③
```

No.	Contents
①	Displays the ROM version of the camera.
②	Displays the ROM version of the camera adapter.
③	Displays the ROM (IC105, IC106/AT-141 board) version of the HDCU-900.

ROM Version (HDC-900 Series) Display

Displays the ROM versions of the unit and the peripheral equipment of the unit.

```
      * ROM Version *

  CHU     4.10        99.07.22  ①
  CCU     3.04        98.08.11  ②
```

No.	Contents
①	Displays the ROM version of the camera.
②	Displays the ROM (IC105, IC106/AT-141 board) version of the HDCU-900.

Section 2
Replacement of Main Parts

2-1. Replacing the Switching Regulator

WARNING

The components marked ⚠ are critical to safe operation. If you replace with parts other than the specified ones, fire or electric shock may result.

CAUTION

When repairing or replacing the power supply block, set the voltage. If the voltage is set incorrectly, a fire or electric shock may result.

- When repairing or replacing the power supply block, set to the same power supply voltage as that of repair shop work bench.
- When delivering to the user, adjust the power supply voltage to suit the user.

Gently remove or attach the power supply unit while holding it by hand.
Otherwise, the unit may fall, causing an injury.

If the power supply unit is not attached securely, the contact resistance of the unit increases, which may result in damage to parts or a fire. Tighten completely the fixing screws of the power supply unit.
Do not turn on the power before fixing the power supply unit securely.

Replacement Part

Part : Switching regulator
Part No. : ⚠ A-8312-120-B

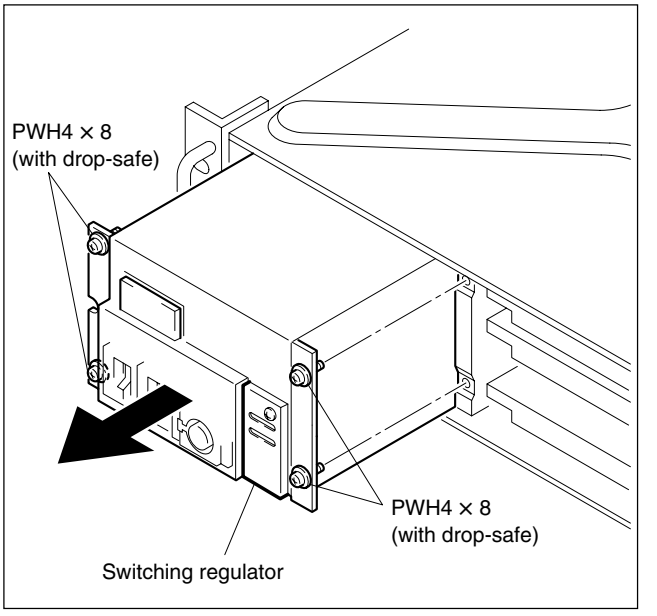
Replacement Procedure

1. Turn off the main power and disconnect the plug from the outlet.

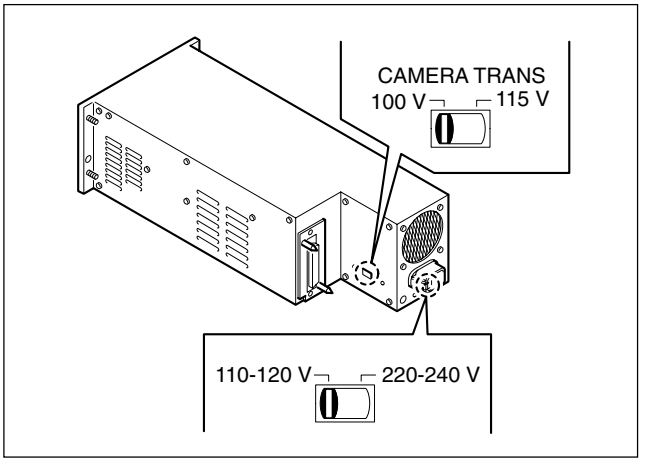
   Note

   Wait for at least three minutes before starting replacement, because there are electrically live blocks inside the machine that could cause electric shock.

2. Remove the front panel. (Refer to Section 1 of the Installation and Maintenance Manual.)
3. Fully loosen the four screws (with drop-safe) and remove the switching regulator in the direction of the arrow.



4. Set the two voltage selectors of the new switching regulator as shown in the following figure.
5. Attach the switching regulator in reverse order of step 3.



Note

When using the unit at a voltage other than the specified voltage, contact your local Sony Sales Office/Service Center.

2-2. Replacing the Fuse

WARNING

The components marked ⚠ are critical to safe operation. If you replace with parts other than the specified ones, fire or electric shock may result.

Replacement Part

Note

The CAMERA fuse differs depending on the destination of the unit.

MAIN fuse

Part : Fuse (6.3 A, 250 V)
Part No. : ⚠ 1-576-233-11

CAMERA fuse

For UC
Part : Fuse (100 to 120 V, 6.3 A, 250 V)
Part No. : ⚠ 1-576-233-11

For CE
Part : Fuse (220 to 240 V, 4 A, 250 V)
Part No. : ⚠ 1-576-231-11

Replacement Procedure

1. Turn off the main power and disconnect the plug from the outlet.

   Notes

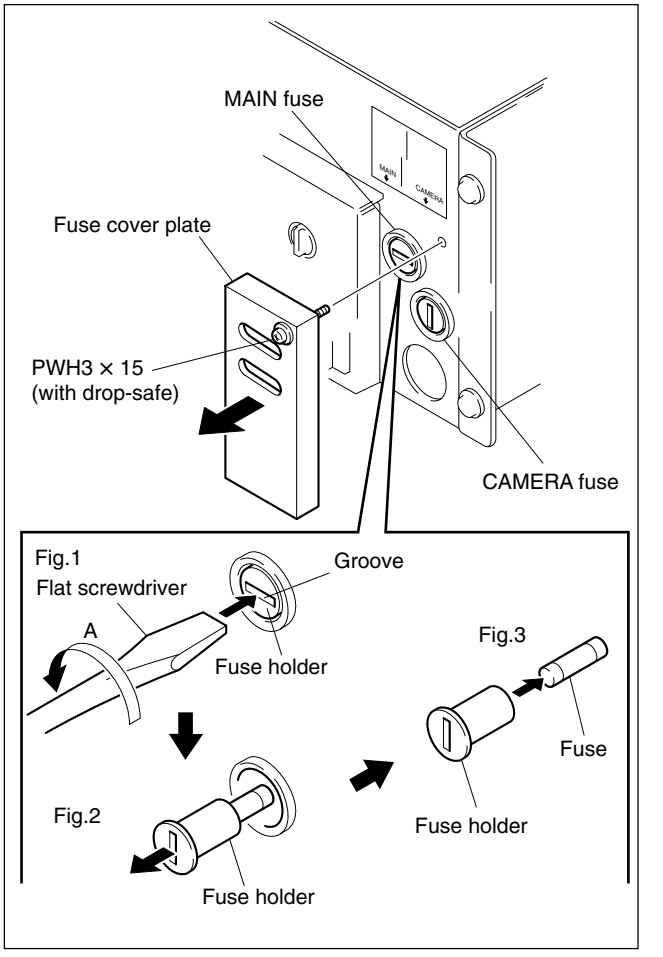
   - Wait for at least three minutes before starting replacement, because there are electrically live blocks inside the machine that could cause electric shock.
   - Remove any foreign objects inside the machine that could cause a short before replacement.

2. Remove the front panel. (Refer to Section 1 of the Installation and Maintenance Manual.)
3. Fully loosen the screw (with drop-safe) and remove the fuse cover plate.

   Note

   The MAIN and CAMERA fuses can be replaced in the same way.

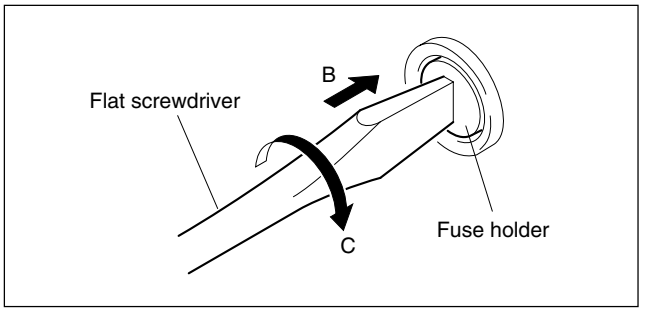
4. Insert a flat screwdriver into the groove of the fuse holder, and rotate it in the direction of arrow A (by about 90°) to unlock. (Fig. 1)
5. Remove the fuse with the entire fuse holder. (Fig. 2)
6. Remove the fuse from the fuse holder. (Fig. 3)



7. Attach a new fuse in reverse order of steps 3 to 6.

   Note

   A spring is already attached in the fuse holder. When attaching a new fuse, rotate the flat screwdriver in the direction of arrow C (by about 90°) while pressing it in the direction of arrow B to lock the fuse holder.



2-3. Removing the Rear Panel

1. Turn off the main power and disconnect the plug from the outlet.

   Notes

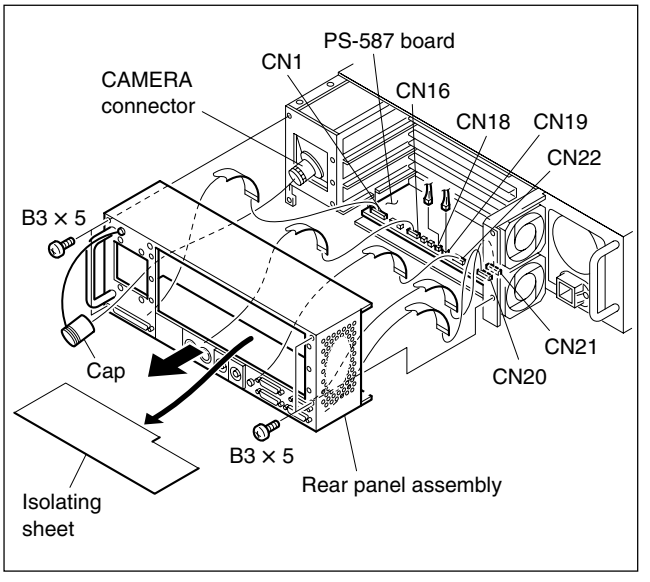
   - Wait for at least three minutes before starting replacement, because there are electrically live blocks inside the machine that could cause electric shock.
   - If you bend or pull out the optical fiber cable forcibly, disconnection may result. Handle the cable carefully.

2. Remove the boards and the blank panel from the rear panel. (Refer to Section 1 of the Installation and Maintenance Manual.)
3. Remove the cap from the CAMERA connector.
4. Remove the four screws and slide the rear panel assembly in the direction of the arrow.
5. Remove the isolating sheet.

   Note

   The isolating sheet is not fixed.

6. Disconnect the connectors (CN1, CN16, CN18, CN19, CN20, CN21, CN22) of the PS-587 board, then remove the rear panel assembly.



7. Reattach the rear panel in reverse order of the disassembling procedure.

2-4. Replacing the DC Fan (Rear Panel)

CAUTION

If the fan is defective, the temperature inside the unit will rise. Touching the inside of the unit in this state may cause a burn.
Replace the parts after turning off the power and cooling the inside.

The fans that are used in the unit of the rear panel are recommended replacement parts.
The lifespan of these fans is about 30,000 hours, which means that the fans can be used for about three and a half years if the power is on all the time, so as a guideline the fans should be replaced every three and a half years.

Note

The rear panel is provided with the two DC fans.

Replacement Procedure

1. Turn off the main power and disconnect the plug from the outlet.

   Note

   Wait for at least three minutes before starting replacement, because there are electrically live blocks inside the machine that could cause electric shock.

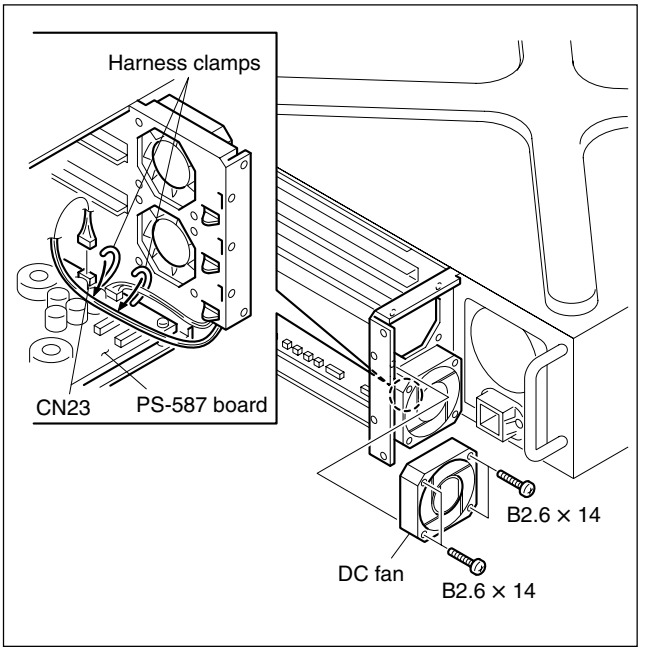
2. Remove the rear panel. (Refer to Section 2-3.)

   Note

   Only either the upper or the lower DC fan can be replaced.

Replacing the upper fan

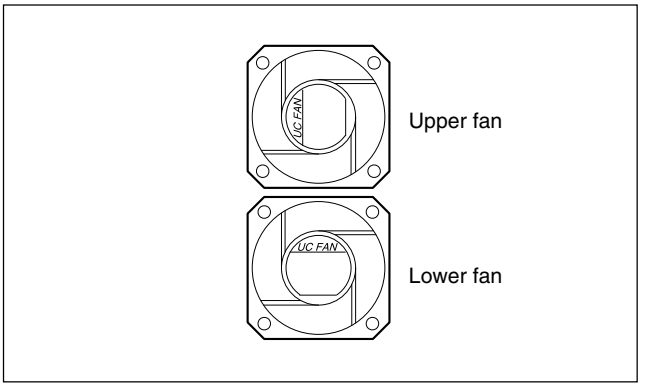
1. Disconnect the harness from the two harness clamps.
2. Disconnect the connector (CN23) from the PS-587 board.
3. Remove the four screws and remove the DC fan.



4. Attach a new DC fan in reverse order of steps 1 to 3.

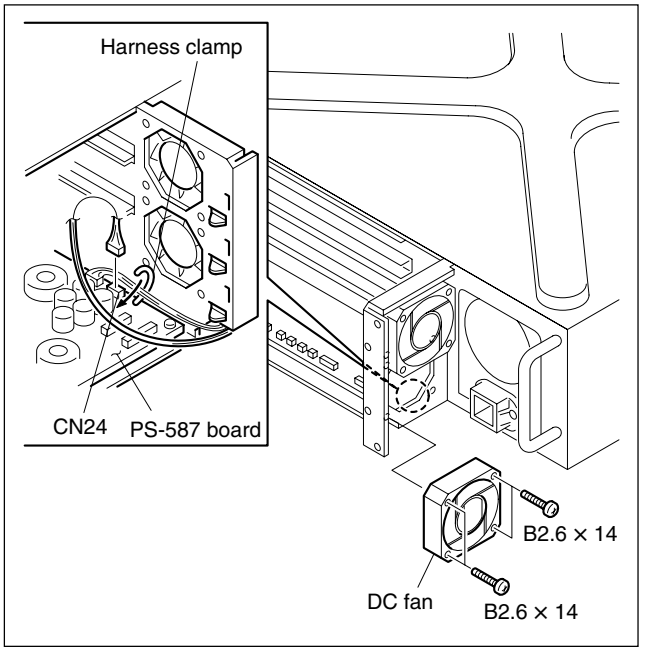
Note

Attach the DC fan in the direction shown below.



Replacing the lower fan

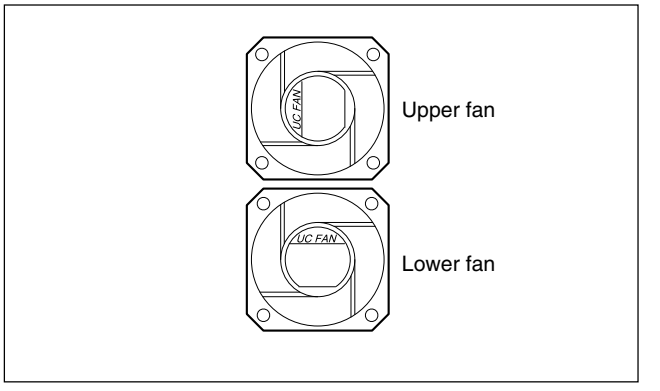
1. Disconnect the harness from the harness clamp.
2. Disconnect the connector (CN24) from the PS-587 board.
3. Remove the four screws and remove the DC fan.



4. Attach a new DC fan in reverse order of steps 1 to 3.

Note

Attach the DC fan in the direction shown below.



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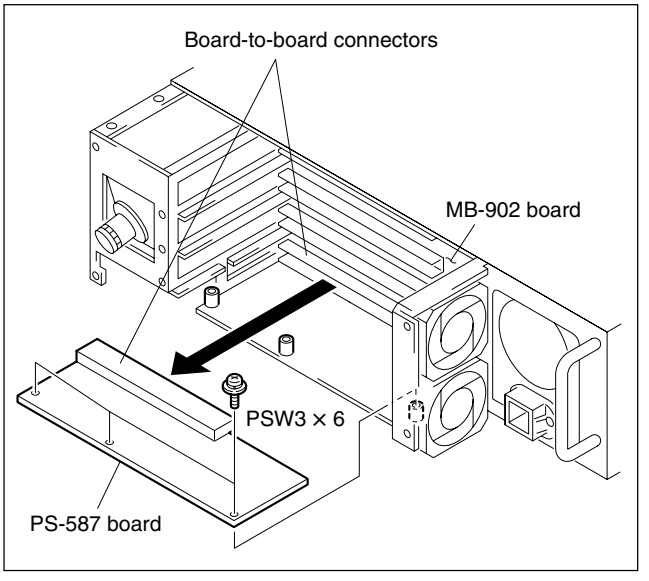
2-5. Replacing the PS-587 Board

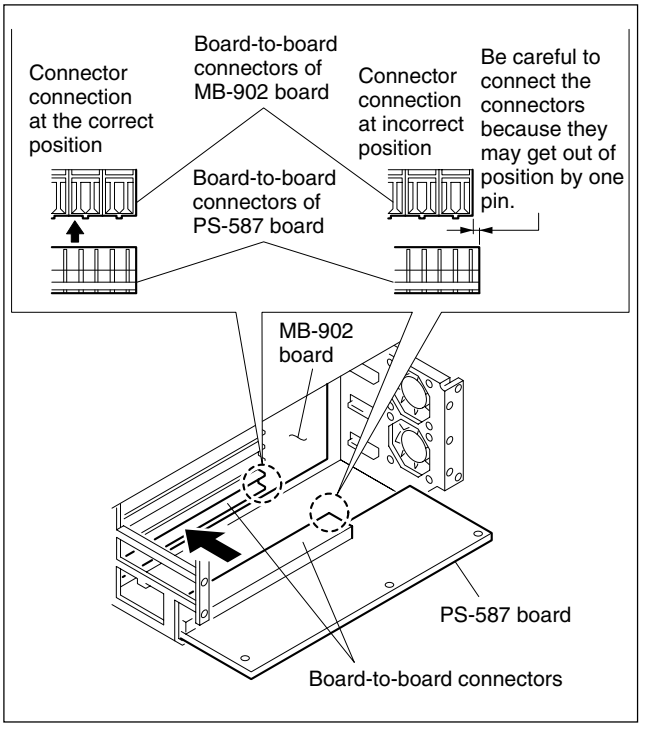
Replacement Procedure

1. Turn off the main power and disconnect the plug from the outlet.
   Note
   Wait for at least three minutes before starting replacement, because there are electrically live blocks inside the machine that could cause electric shock.

2. Remove the rear panel. (Refer to Section 2-3.)
3. Disconnect the connectors (CN23, CN24) of the DC fan. (Refer to Section 2-4.)
4. Remove the three screws and remove the MB-902 board from the board-to-board connector connected to the PS-587 board.



5. Attach a new PS-587 board in reverse order of step 4.
   Note
   When connecting the PS-587 board and MB-902 board, the MB-902 board may get out of position by one pin. Connect the boards securely with great care.


Connector connection at the correct position
Board-to-board connectors of MB-902 board
Connector connection at incorrect position
Be careful to connect the connectors because they may get out of position by one pin.
Board-to-board connectors of PS-587 board
MB-902 board
PS-587 board
Board-to-board connectors

2-6. Replacing the RX-53 Board

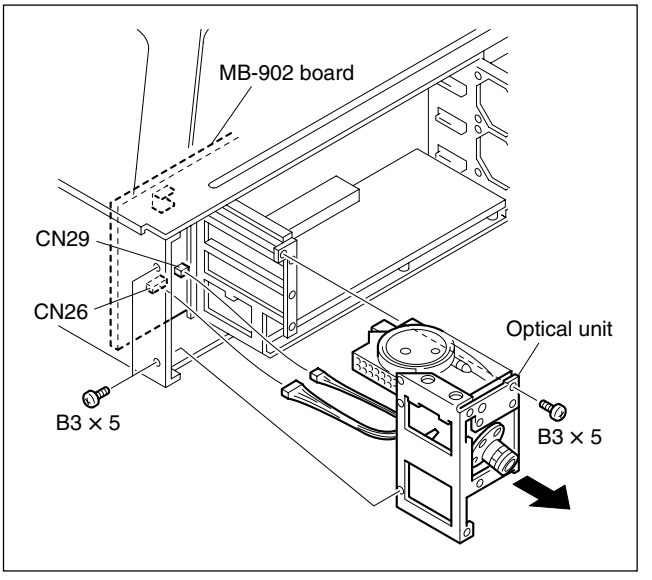
Notes

- The electric parts mounted on the RX-53 board cannot be replaced or adjusted.
  If the electric parts need to be replaced or adjusted, replace the entire unit.
- If you bend or pull out the optical fiber cable forcibly, disconnection may result. Handle the cable carefully.

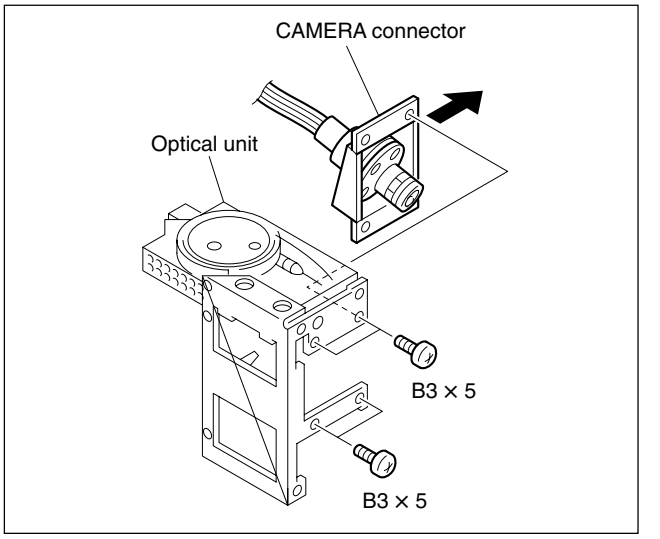
Replacement Procedure

1. Turn off the main power and disconnect the plug from the outlet.
   Note
   Wait for at least three minutes before starting replacement, because there are electrically live blocks inside the machine that could cause electric shock.

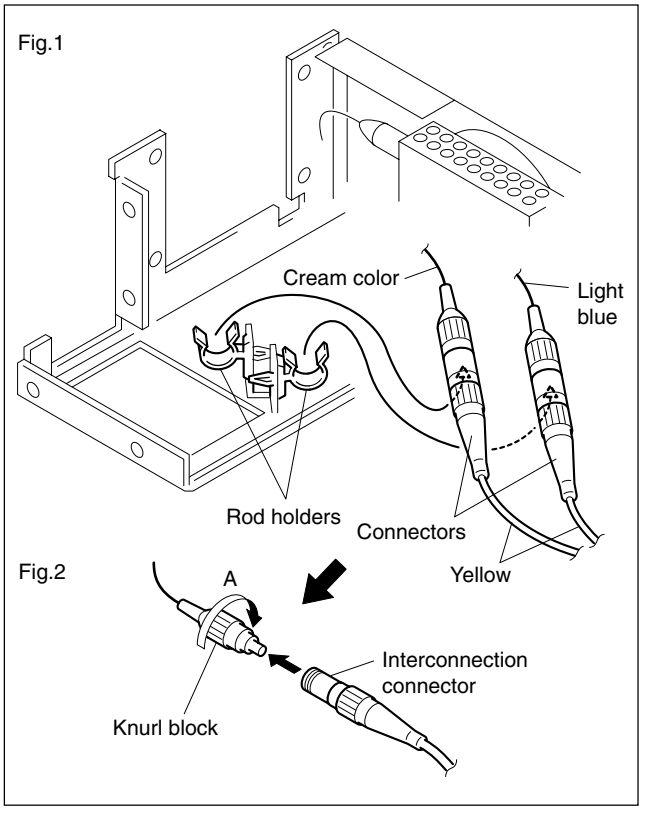
2. Remove the rear panel. (Refer to Section 2-3.)
3. Remove the three screws and slide the optical unit in the direction of the arrow.
4. Disconnect the connectors (CN26, CN29) of the MB-902 board and remove the optical unit.



5. Remove the four screws and remove the CAMERA connector from the optical unit.



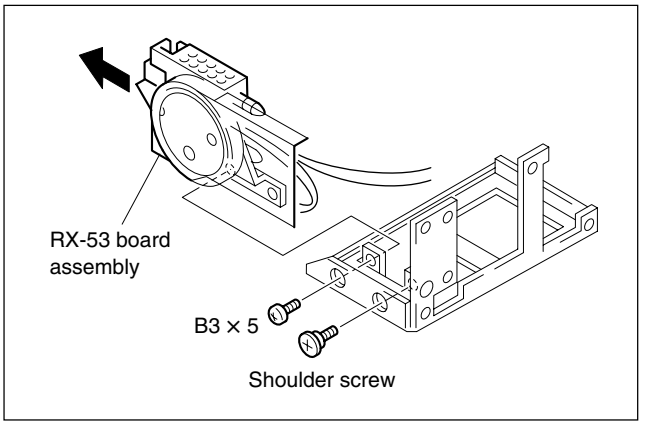
6. Disconnect the two connectors from the rod holder. (Fig. 1)
7. Rotate each knurl block in the direction of arrow A to remove the connector. (Fig. 2)
   Note
   The interconnection connector should be remain connected to the mate connector (yellow). To avoid the signal degration, do not touch an exposed tip of the connector.



8. Remove the two screws (B3 × 5, shoulder screw) and remove the board assembly in the direction of the arrow.

Note

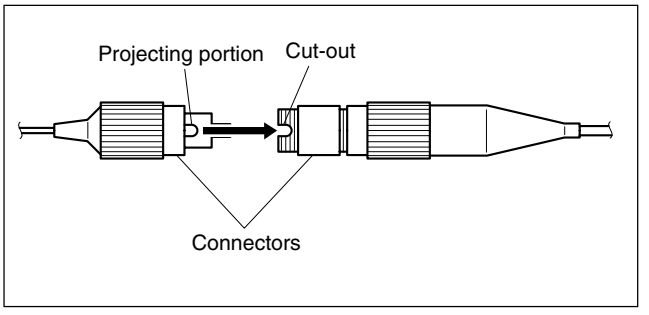
Be careful not to bend the cables (especially light blue and cream color).



9. Attach the new RX-53 board assembly in reverse order of steps 3 to 8.

Notes

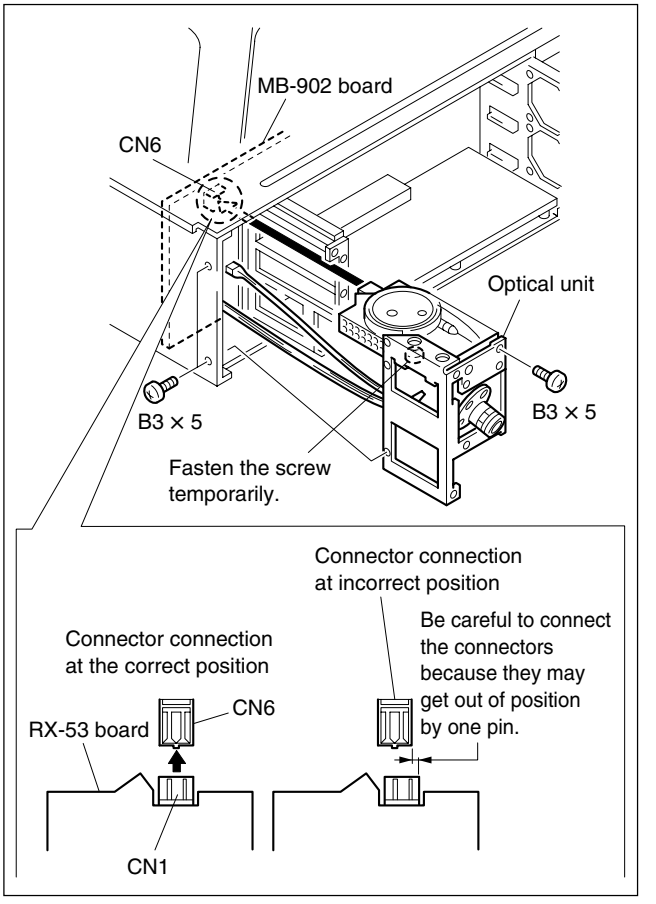
- Before connecting the connector, clean the tip of the connector pin with alcohol.
- When connecting the connector, align the projecting portion with the cut-out.



10. Attach the optical unit to the unit with three screws. First, fasten temporarily the screws shown in the figure, then fasten them securely.

Note

When connecting the connector (CN1) of the RX-53 board and the connector (CN6) of the MB-902 board, the connectors may get out of position by one pin. Connect the boards securely with great care.



11. Attach the rear panel. (Refer to Section 2-3.)

2-7. Replacing the CAMERA Connector

Note

If you bend or pull out the optical fiber cable forcibly, disconnection may result. Handle the cable carefully.

Replacement Procedure

1. Follow steps 1 to 7 of Section 2-6, “Replacing the RX-53 Board”.

   Note

   The interconnection connector should be remain connected to the mate connector (light blue and cream color). To avoid the signal degration, do not touch an exposed tip of the connector.

Fig.1

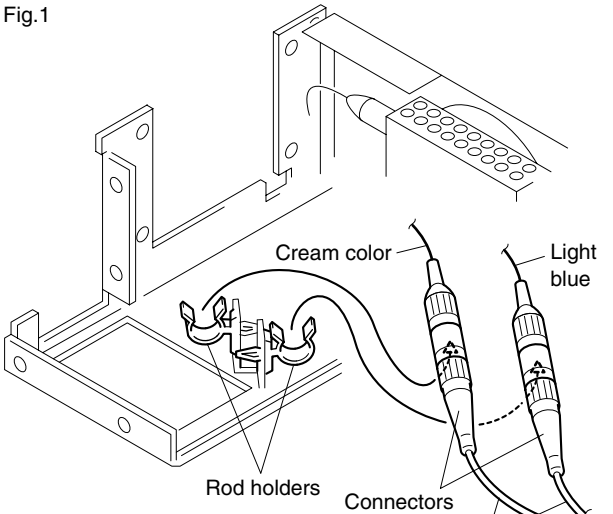
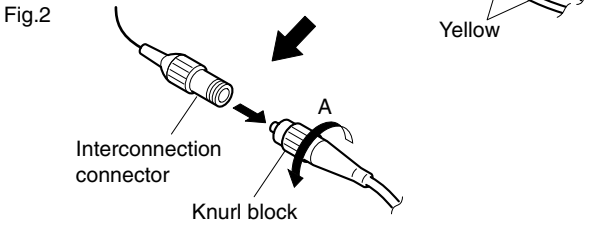


Fig.2



2. Attach a new CAMERA connector in reverse order of removal.

   Note

   For the notes during assembling, refer to step 9 of Section 2-6 and higher.

Section 3
Electrical Alignment

3-1. Preparation

3-1-1. Required Equipment

Measures

- Digital oscilloscope (300 MHz or higher)
  Tektronix TDS460A or equivalent
- HD waveform monitor
  Tektronix 1735HD/1730HD or equivalent
- SD waveform/Vector monitor
  Tektronix 1780R or equivalent (for UC)
  Tektronix 1781R or equivalent (for CE)
- SD signal generator
  Tektronix TSG170A or equivalent (for UC)
  Tektronix TSG271 or equivalent (for CE)
- Audio oscillator
  Tektronix SG-5010 or equivalent
- Frequency counter
  Advantest TR5821AK or equivalent

Related equipment

- HDVS color video camera
  HDC-900 (or HDC-950)
- Master setup unit
  MSU-700A/750

Tools

- Front extension board BKP-7900
- Rear extension board EX-525A
  (Sony P/N : A-8326-353-A)
- Extension board EX-738 (for HDC-900/950)
  (Sony P/N : A-8327-351-A)

3-1-2. Notes on Adjustments

- The measure should have already been calibrated.
- "3-1-4. Initialization Settings" have already been finished.
- The adjustment of the HDC-900 (or HDC-950) haven already been finished.
- Types of the color bars to be output from the built-in SG:

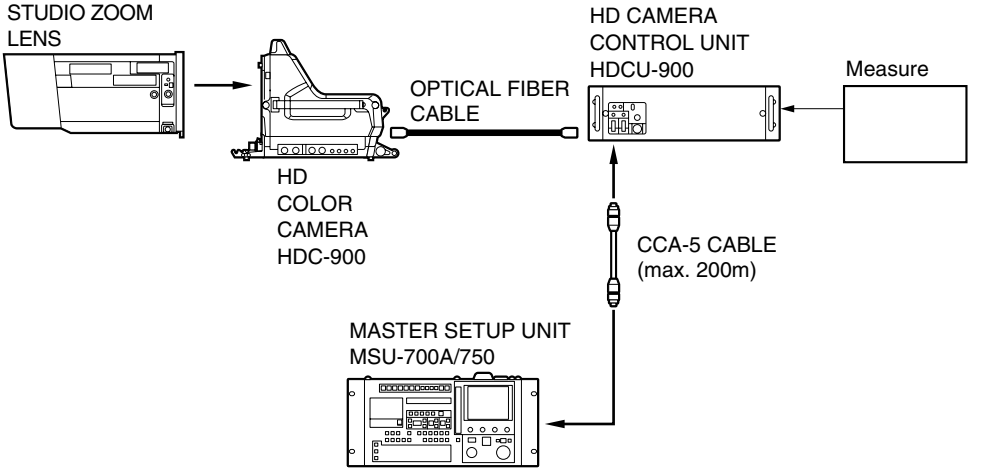
Signal format	Y	C
HD-SDI	100 %	100 %
HD-Analog	100 %	100 %
SD-SDI (D1)	100 %	75 %*1
SD-Component-analog (HKCU-901)	100 %	75 %*1
SD-Composite-analog (HKCU-901)	75 %	75 % (SMPTE)
SD-Composite-analog (HKCU-901)	100 %	75 % (EBU)

*1 : When S811-1 on the RC-86 board is ON and S811-2 is OFF (factory setting)

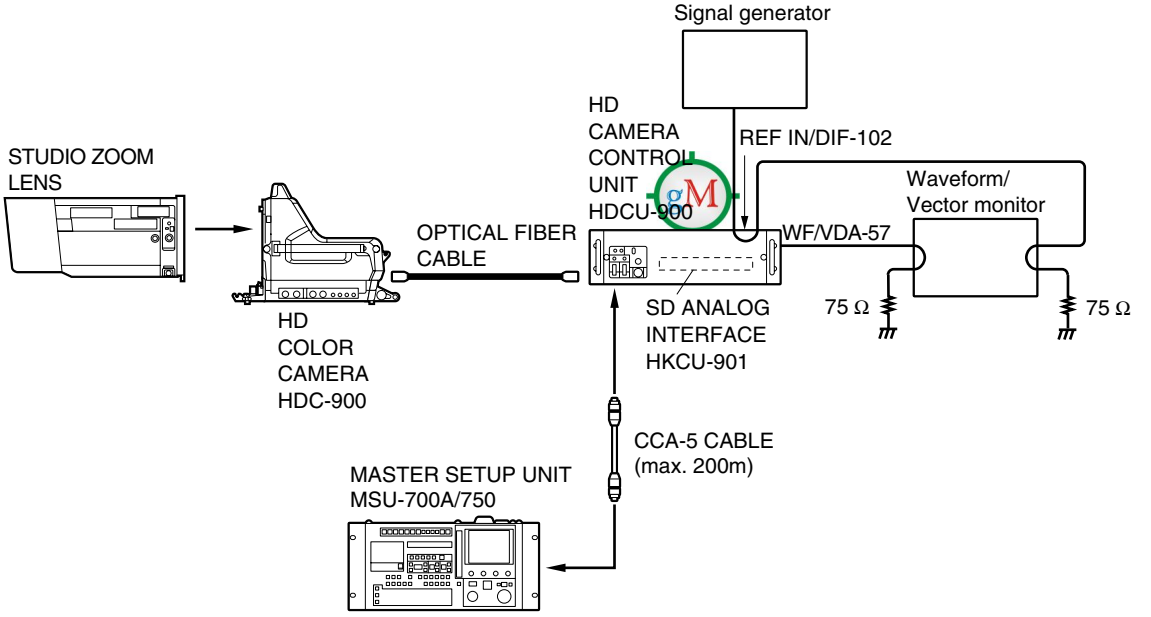
- To adjust the unit, extend each plug-in board. Before pulling out the boards, be sure to turn off the main power.
- Before starting adjustment, warm up for about 10 minutes.
- Before using the MSU-700A/750, check the version of the ROM. For details, refer to Section 1-1, "Checking the ROM Version" of the separate Installation and Maintenance Manual.

3-1-3. Connection of Equipment

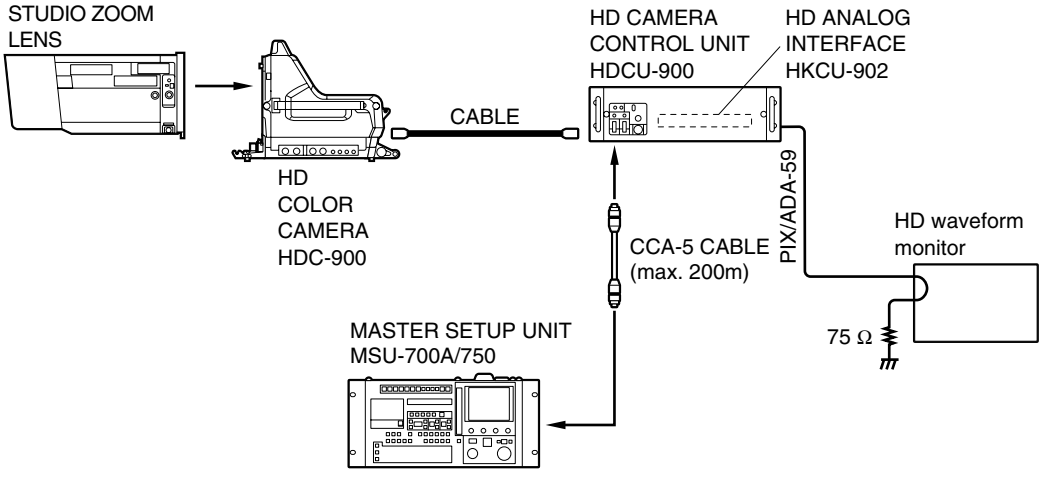
Adjusting the HDCU-900



Adjusting the HDCU-901



Adjusting the HDCU-902



3-1-4. Initialization Settings

HDCU-900

Note

When changing the switch settings from the customer's setting positions, it is recommended to write down the customer's setting positions in the following table. After completing the adjustment, be sure to return the switches to the customer's setting positions.

Board	Switch	Setting during adjustment	Customer setting
AT-141	S102 to 105	All OFF	
	S110	REMOTE	
	S301	0 dBu	
	S302	0 dBu	
	S401	0 dBu	
	S402	0 dBu	
	S403, 41	RTS	
	S404, 504	4W	
	S501	OFF	
	S502	2ch	
	S503	PROD	
	S601	LOCAL	
	S602	BB	
RC-86	S804	422YC	
	S805	REMOTE	
IF-789A*1/789P*2	S101-1	ON	
	S101-2	SMPTE	
	S201	OFF	
	S202	ON	
	S706	3WAVE	

Set the switches other than the above to the state when shipped from the factory.
For details of the switch settings, refer to Section 1-5, "Settings of Switches and Controls on Boards" of the separate Installation and Maintenance Manual.

*1 : for UC
*2 : for CE

When using the MSU-700A:

- Power supply and signal selector block
  - ALL button → OFF (Dark)
  - CAM PW button → ON (Lit)
  - TEST1 button → OFF (Dark)
  - TEST2 button → OFF (Dark)
  - BARS button → OFF (Dark)
  - CLOSE button → ON (Lit)

- Camera/CCU circuit ON/OFF block
  - DETAIL OFF button → OFF (Lit)
  - KNEE OFF button → ON (Dark)
  - AUTO KNEE button → OFF (Dark)
  - MATRIX OFF button → OFF (Lit)

- AUTO SETUP block
  - LEVEL button → OFF (Dark)
  - WHITE button → OFF (Dark)
  - BLACK button → OFF (Dark)

- Others
  - GAMMA OFF button → OFF (Dark)
  - MASTER GAIN selector button → 0

When using the MSU-750:

- Power supply and signal selector block
  - ALL button → OFF (Dark)
  - CAM PW button → ON (Lit)
  - TEST button → OFF (Dark)
  - BARS button → OFF (Dark)
  - CLOSE button → ON (Lit)

- AUTO SETUP block
  - LEVEL button → OFF (Dark)
  - WHITE button → OFF (Dark)
  - BLACK button → OFF (Dark)

- Others
  - GAMMA OFF* → ON (Not highlighted)
  - MASTER GAIN* → 0 (0 dB)

* : Press the function button and select it on the function menu display.

3-2. Audio System Adjustment

3-2-1. Microphone Level Adjustment

Measures : Oscilloscope, Audio oscillator

Note

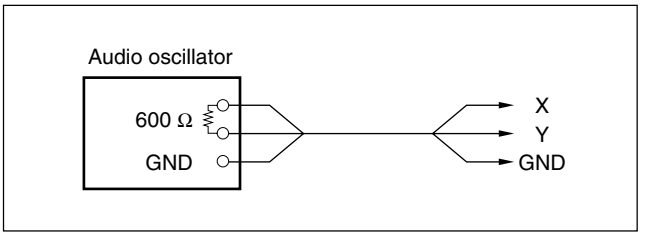
This adjustment is described on the premise that the output impedance of the audio oscillator is 600 Ω.

Preparation

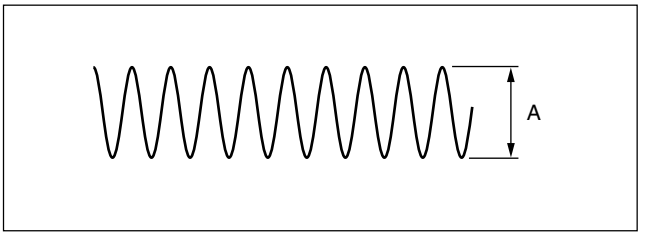
- Board extension : AT-141 board (front side)
- Board extension : AU-271 board (CAMERA side)
- S126 (MIC CH-1 LEVEL)/AT-141 board panel side → MIN
- S128 (MIC CH-2 LEVEL)/AT-141 board panel side → MIN
- S402 (E-3)/AT-141 → 0 dBu
- S401 (D-3)/AT-141 → 0 dBu

Adjustment Procedure

1. MIC1 level adjustment
   Input a sine wave of 1 kHz, 220 mV p-p (−20 dBu) from the audio oscillator to 20-pin (X), 19-pin (Y) and 18-pin (G) of the extension board (camera side).

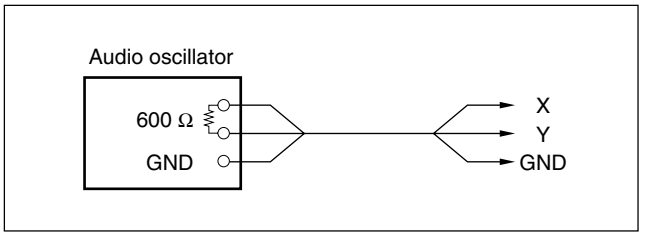


2. Measuring point : TP401 (E-3)/AT-141 or AUDIO OUTPUT CH-1 connector/HDCU rear panel
   Adjusting point : ◓RV401 (E-2)/AT-141
   Specifications : A = 1100 ±50 mV p-p

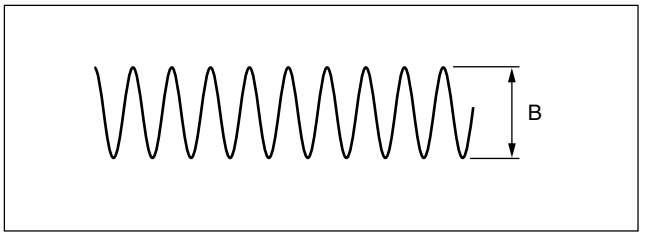


3. Remove the cable that is connected in step 1.

4. MIC2 level adjustment
   Input a sine wave of 1 kHz, 220 mV p-p (−20 dBu) from the audio oscillator to 15-pin (X), 16-pin (Y) and 17-pin (G) of the extension board (camera side).



5. Measuring point : TP402 (D-3)/AT-141 or AUDIO OUTPUT CH-2 connector/HDCU rear panel
   Adjusting point : ◓RV402 (D-2)/AT-141
   Specifications : B = 1100 ±50 mV p-p



Setting after Adjustment

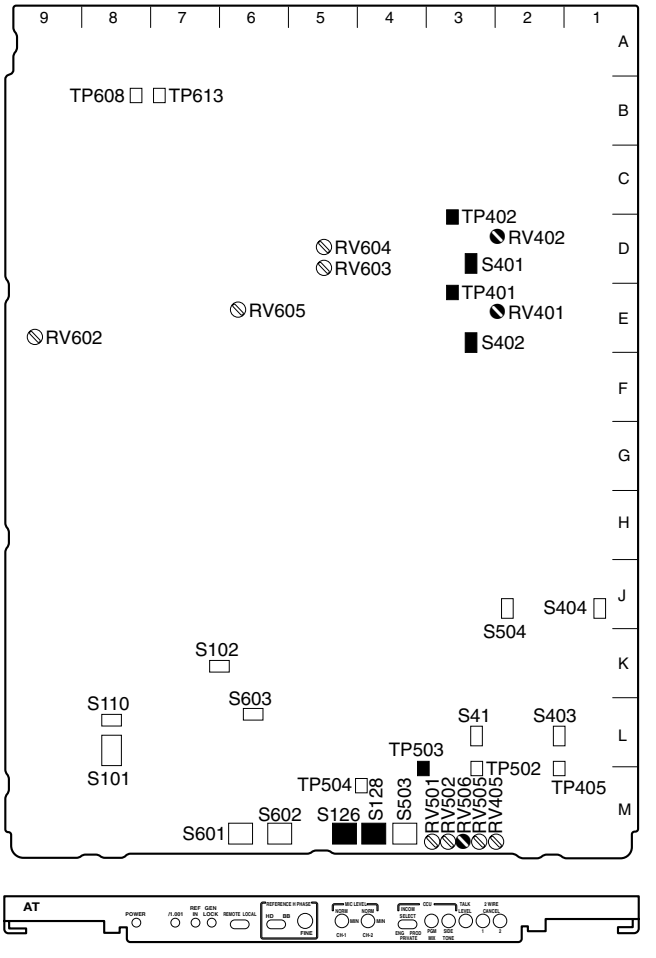
S401 (D-3), S402 (E-3)/AT-141 → Return to the original setting.

3-2-2. Front Intercom Microphone Level Adjustment

Measures : Oscilloscope, Audio generator

Note

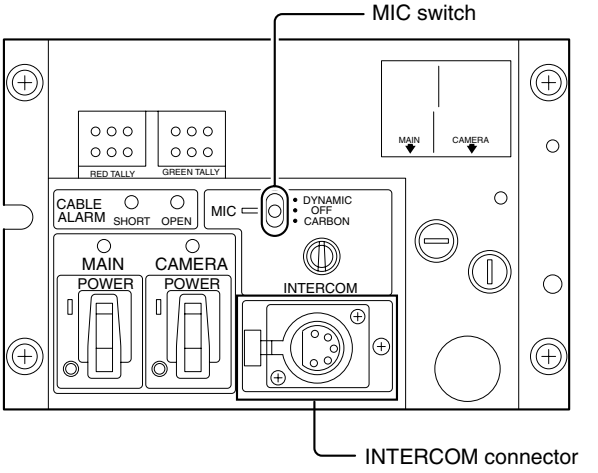
This adjustment is described on the premise that the output impedance of the audio oscillator is 600 Ω.



AT-141 board (A side and panel side)

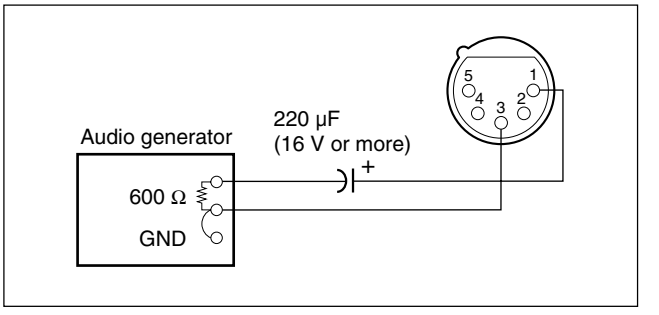
Preparation

- MIC switch/HDCU front panel → CARBON
- Board extension : AT-141 board (front side)

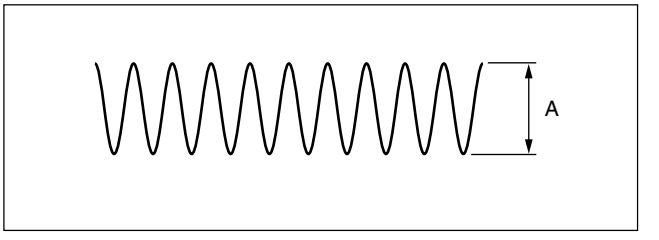


Adjustment Procedure

1. Connect the audio oscillator and the INTERCOM connector on the HDCU front panel as shown in the following figure.



2. Input a sine wave of 1 kHZ, 220 mV p-p (−20 dBu) from the audio oscillator.
3. Measuring point : TP503 (M-4)/AT-141
   Adjusting point : ◓RV506 (TALK LEVEL)/AT-141 board panel side
   Specifications : A = 200 ±10 mV p-p



3-2-3. RTS Intercom Adjustment

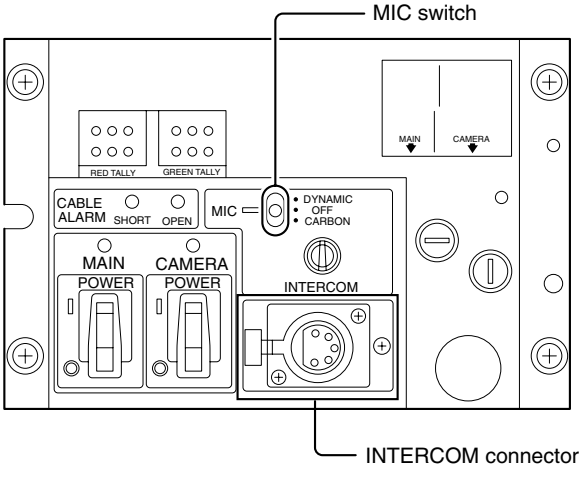
Measures : Oscilloscope, Audio generator

Note

- This adjustment is described on the premise that the output impedance of the audio oscillator is 600 Ω.
- When the intercom system is the RTS system, perform this adjustment.

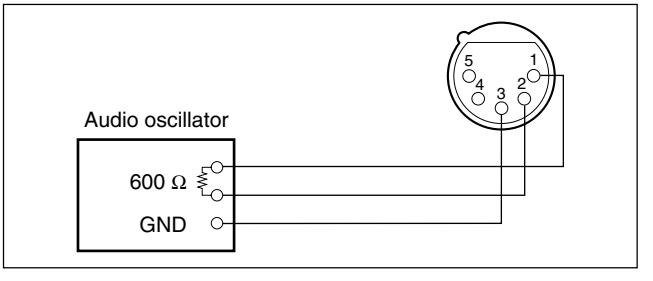
Preparation

- MIC switch/HDCU front panel → CARBON
- Board extension : AT-141 board (front side)
- S504 (J-2)/AT-141 → RTS
- S404 (J-1)/AT-141 → RTS
- S503 (INCOM SELECT)/AT-141 board panel side → PROD
- S41 (L-3)/AT-141 → RTS
- S403 (L-2)/AT-141 → RTS
- Connect a resistance of 200 Ω between A74-pin and A75-pin of the extension board.

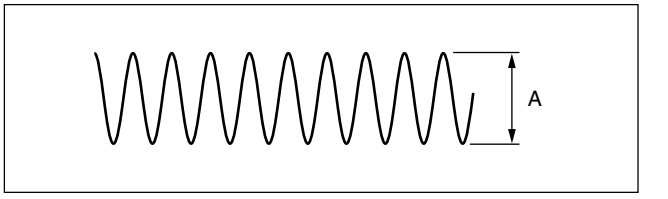


Adjustment Procedure

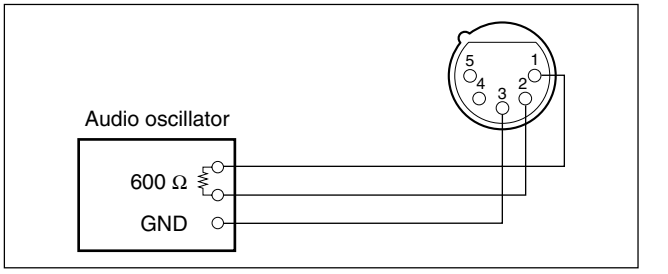
1. Input a sine wave of 1 kHz, 220 mV p-p (−20 dBu) from the audio oscillator to 2-pin (X), 1-pin (Y) and 3-pin (G) of the INTERCOM connector on the HDCU front panel.



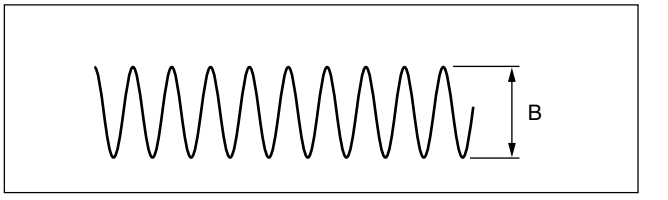
2. PROD CANCEL adjustment
   Measuring point : TP502 (M-3)/AT-141
   Adjusting point : ◓RV505 (2WIRE CANCEL 1)/ AT-141 board panel side
   Specifications : A = Minimize



3. ENG CANCEL adjustment
   S503 (INCOM SELECT)/AT-141 board panel side → ENG
4. Connect a resistance of 200 Ω between A72-pin and A73-pin of the extension board.
5. Input a sine wave of 1 kHz, 220 mV p-p (−20 dBu) from the audio oscillator to 2-pin (X), 1-pin (Y) and 3-pin (G) of the INTERCOM connector on the HDCU front panel.



6. Measuring point : TP405 (M-2)/AT-141
   Adjusting point : ◓RV405 (2WIRE CANCEL 2)/ AT-141 board panel side
   Specifications : B = Minimize



Setting after Adjustment

After adjustment is completed, return the switches to the original setting.

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3-2-4. PGM Mix Level Adjustment

Measures : Oscilloscope, Audio oscillator

Note

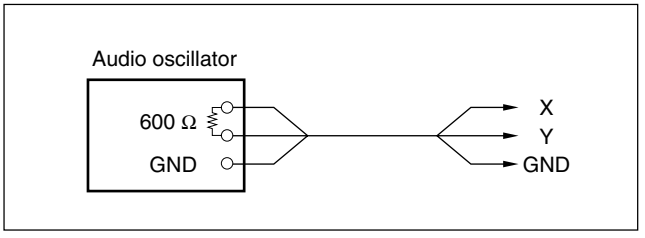
This adjustment is described on the premise that the output impedance of the audio oscillator is 600 Ω.

Preparation

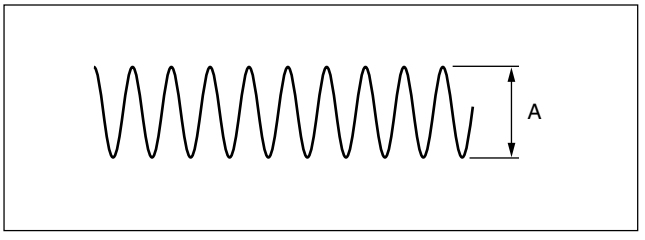
Board extension : AT-141 board (front side)

Adjustment Procedure

1. Input a sine wave of 1 kHz, 2.2 V p-p (0 dBu) from the audio oscillator to C77-pin (X), D77-pin (Y) and D76-pin (G) on the extension board of the AT-141 board.

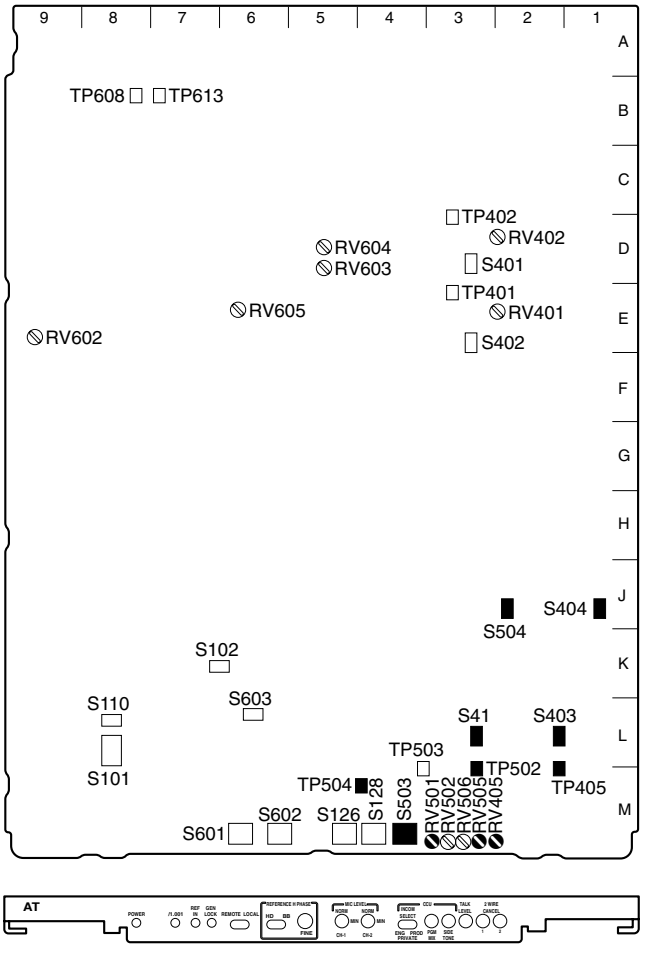


2. Measuring points : TP504 (M-4)/AT-141 or 4-pin (X)/ INTERCOM connector, 3-pin (G)/ HDCU front panel
   Adjusting point : ⊘RV501 (PGM MIX)/AT-141 board panel side
   Specifications : A = 100 ±20 mV p-p



Note

These specifications are set for service. When using this unit, adjust the level to suit the user.



AT-141 board (A side and panel side)

3-2-5. Side Tone Level Adjustment

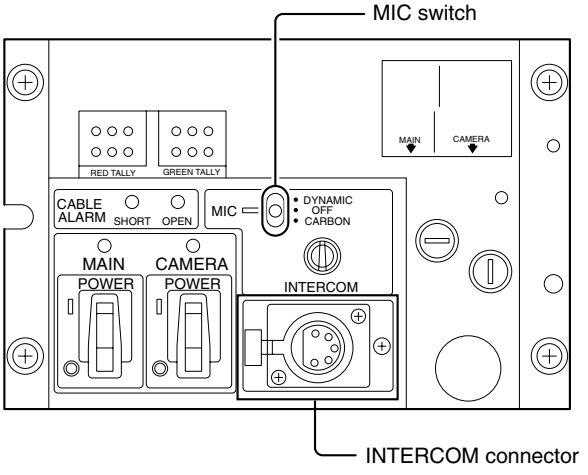
Measures : Oscilloscope, Audio oscillator

Note

This adjustment is described on the premise that the output impedance of the audio oscillator is 600 Ω.

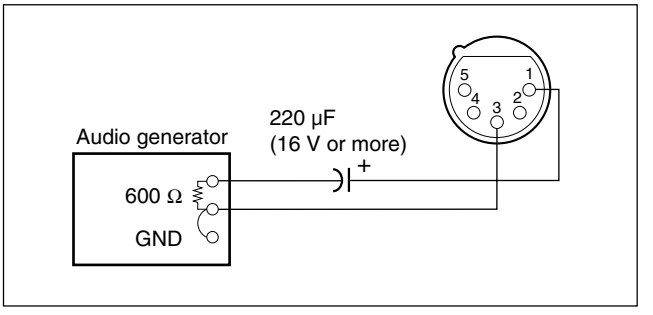
Preparation

- MIC switch/HDCU front panel → CARBON
- Board extension : AT-141 board (front side)

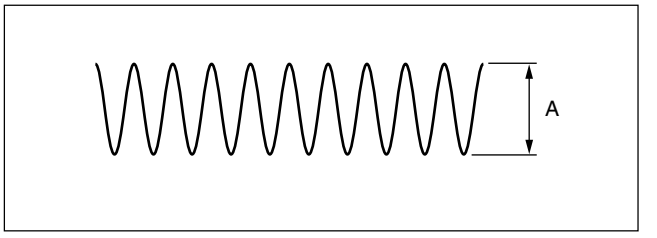


Adjustment Procedure

1. Connect the audio oscillator and the INTERCOM connector on the HDCU front panel as shown in the following figure and input a sine wave of 1 kHz, 220 mV p-p (−20 dBu).

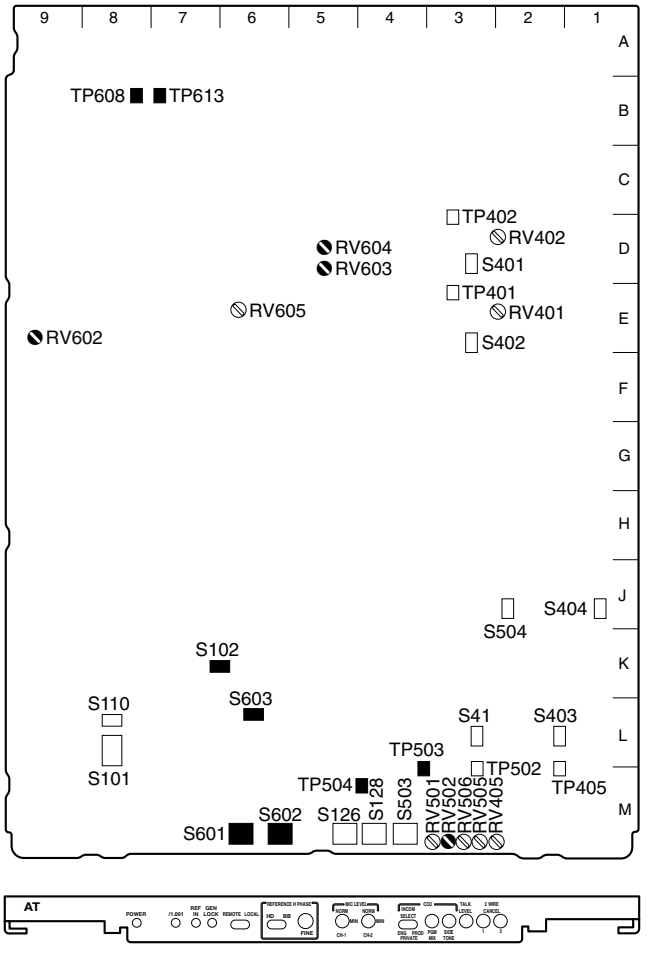


2. Adjust the output level of the audio oscillator so that a sine wave of 1 kHz, 200 mV p-p appears on TP503 (M-4) on the AT-141 board.
3. Measuring points : TP504 (M-4)/AT-141
   Adjusting point : ⊘RV502 (SIDE TONE)/AT-141 board panel side
   Specifications : A = 20 ±2 mV p-p



Note

These specifications are set for service. When using this unit, adjust the level to suit the user.



AT-141 board (A side and panel side)

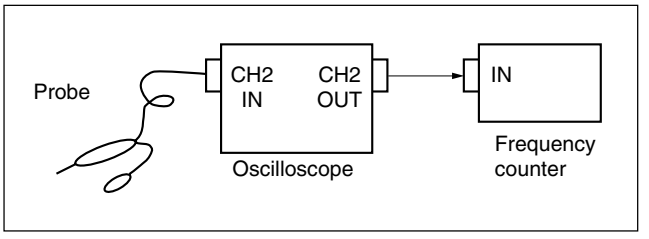
3-3. Video and Reference Signal System Adjustment

3-3-1. HD-SDI Output VCO Free-run Adjustment

Measure : Frequency counter

Preparation

- Board extension: AT-141 board (front side)
- Remove the cable connected to the REFERENCE IN connector on the HDCU rear panel.
- S603 (L-6)/AT-141 →/1000
- S601 (REMOTE/LOCAL)/AT-141 board panel side → LOCAL
- S602 (REFERENCE)/AT-141 board panel side → HD
- S102-8 (K-6)/AT-141 → OFF
- Connect the measure as shown in the following figure.
- After turning on the power, wait for 10 minutes at least and start adjustment.



Adjustment Procedure

1. HD (60) frequency adjustment
   Measuring point : TP613 (B-7)/AT-141
   Adjusting point : ⊘RV604 (D-5)/AT-141
   Specifications : 74,250,000 ± 10 Hz

2. S603 (L-6)/AT-141 → /1001
3. HD (59.94) frequency adjustment
   Measuring point : TP613 (B-7)/AT-141
   Adjusting point : ⊘RV603 (D-5)/AT-141
   Specifications : 74,175,750 ± 10 Hz

4. S602 (REFERENCE)/AT-141 board panel side→ BB
5. SD frequency adjustment
   Measuring point : TP608 (B-8)/AT-141
   Adjusting point : ⊘RV602 (E-9)/AT-141
   Specifications : 27,000,000 ± 10 Hz

Setting after Adjustment

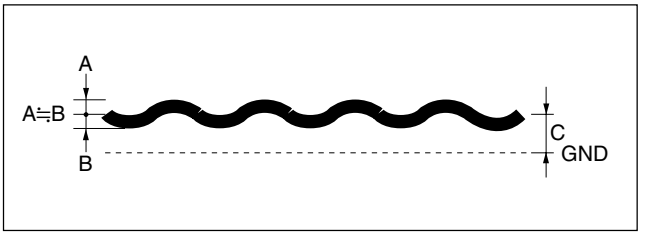
After finishing the adjustment, return the switches to the original setting.

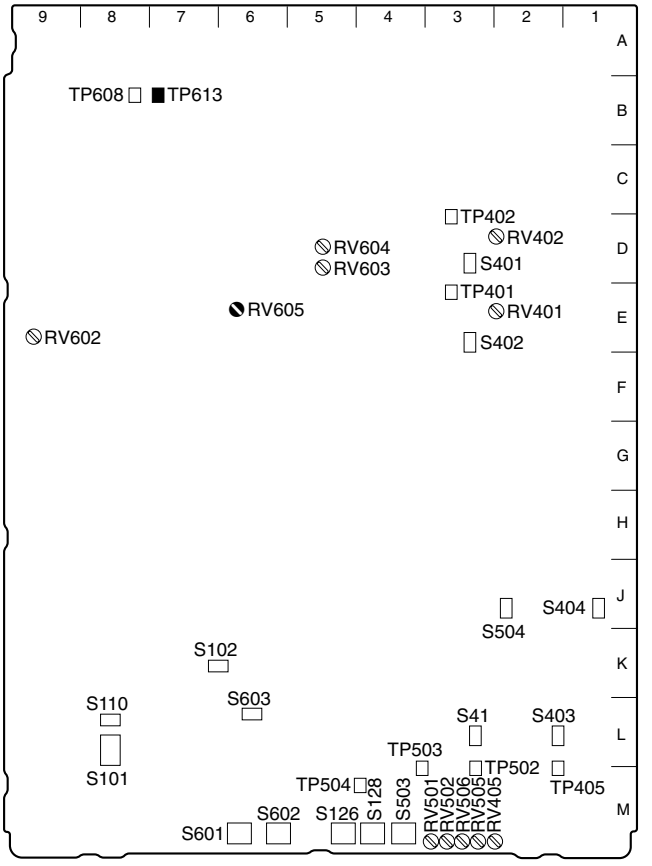
3-3-2. Clock (74 MHz) Duty Adjustment

Measure : Oscilloscope (20 MHz BWLimit: ON)

Adjustment Procedure

Measuring point : TP613 (B-7)/AT-141
Adjusting point : ◓RV605 (E-6)/AT-141
Specifications : C = 1.65 ±0.04 Vdc





AT-141 board (A side)

3-3-3. Prompter Level Adjustment

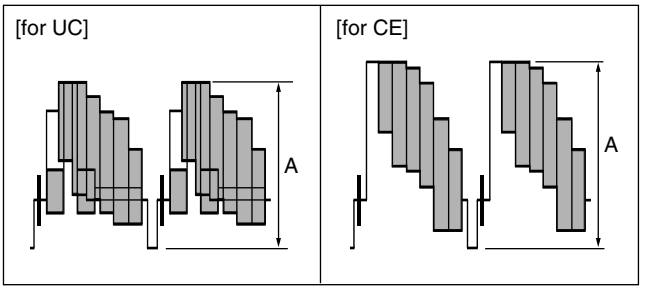
Measures : SD waveform monitor
SD signal generator

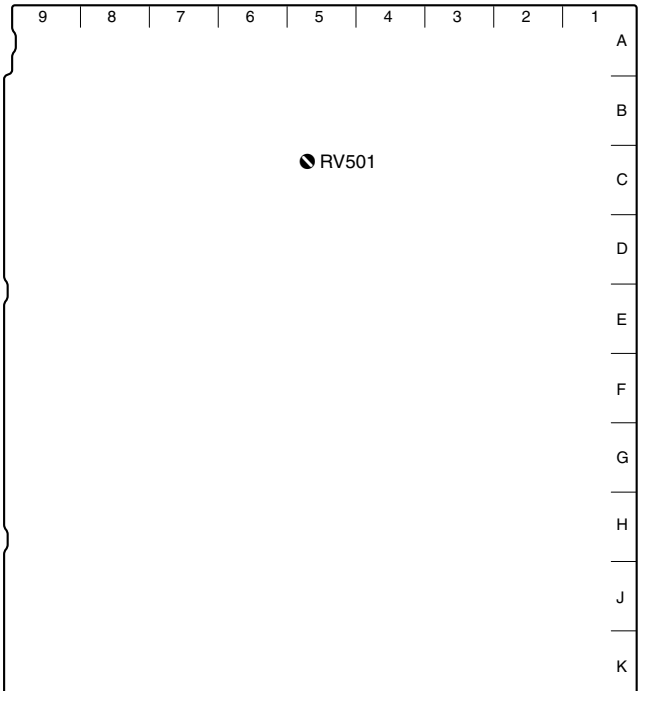
Preparation

Connect the SD signal generator (for UC : SMPTE color bar/for CE : EBU color bar) to the PROMPTER IN connector/SDI-54A.

Adjustment Procedure

Measuring point : PROMPTER connector/CAMERA side
Adjusting point : ◓RV501 (C-5)/DPR-163
Specifications : A = 140 ±1 IRE
(terminated at 75 Ω) (for UC)
A = 1000 ±7 mV p-p
(terminated at 75 Ω) (for CE)





DPR-163 board (A side)

3-4. SD Signal System Adjustment (RC-86 Board)

3-4-1. SD-SDI Output VCO Adjustment

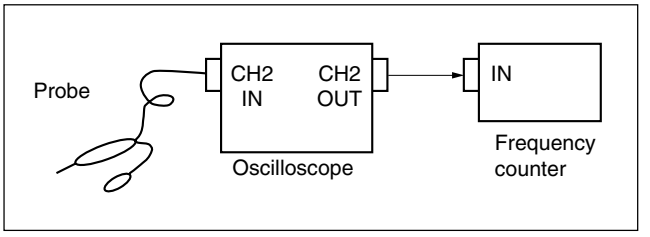
Measure : Frequency counter

Note

After replacing IC508 or IC510 on the RC-86 board only, perform this adjustment.

Preparation

- Board extension : RC-86 board (front side)
- COR501 (B-8)/RC-86 → FREE RUN (Short between 2-pin and 3-pin.)
- Connect the measure as shown in the following figure.
- After turning on the power, wait for 10 minutes at least and start adjustment.



Adjustment Procedure

1. Measuring point : TP501 (A-7)/RC-86
   Adjusting point : ⊘RV501 (A-7)/RC-86
   Specifications : 27.0 ±0.2 MHz

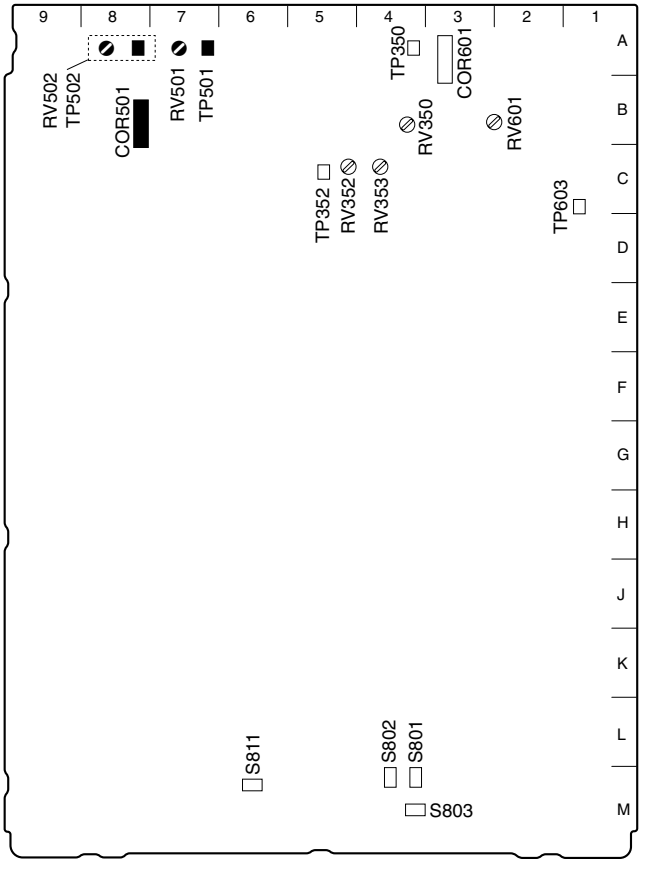
2. Measuring point : TP502 (A-8)/RC-86
   Adjusting point : ⊘RV502 (A-8)/RC-86
   Specifications : 27.0 ±0.2 MHz

Note

After finishing the adjustment and waiting for 10 minutes at least, confirm that each specification is satisfied.
If the specifications are not satisfied, perform the adjustment again.

Setting after Adjustment

COR501 (B-8)/RC-86 → NORMAL
(Short between 1-pin and 2-pin.)



RC-86 board (A side)

3-4-2. SD-SDI Input VCO Free-run Adjustment

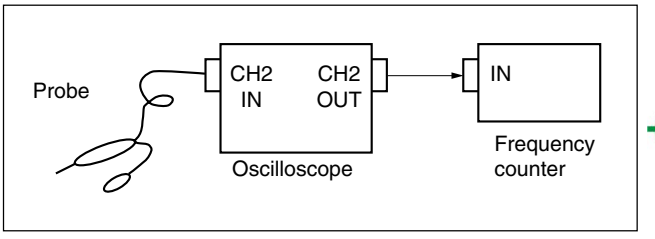
Measure : Frequency counter

Note

After replacing IC601 on the RC-86 board only, perform this adjustment.

Preparation

- Board extension : RC-86 board (front side)
- S110 (L-8)/AT-141 → LOCAL
- S101 (L-8)/AT-141 → All OFF
- COR601 (A-3)/RC-86 → FREE RUN (Short between 2-pin and 3-pin.)
- Connect the measure as shown in the following figure.
- After turning on the power, wait for 10 minutes at least and start adjustment.



Adjustment Procedure

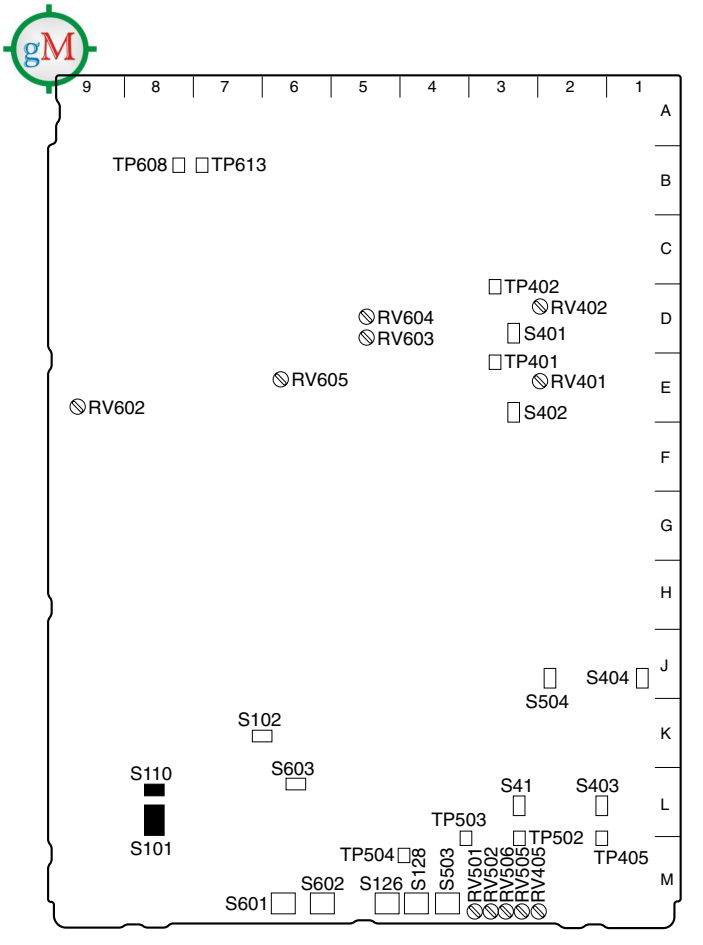
Measuring point : TP603 (C-1)/RC-86
Adjusting point : ◓RV601 (B-3)/RC-86
Specifications : 27.0 ±0.2 MHz

Note

After finishing the adjustment and waiting for 10 minutes at least, confirm that each specification is satisfied.
If the specifications are not satisfied, perform the adjustment again.

Setting after Adjustment

- After finishing the adjustment, return the switches to the original setting.
- COR601 (A-3)/RC-86 → NORMAL
  (Short between 1-pin and 2-pin.)



AT-141 board (A side)

3-4-3. PIX Output Level Adjustment

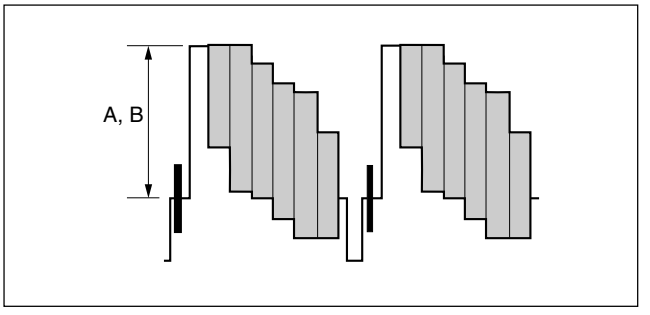
Measures : Oscilloscope, SD waveform monitor

Preparation

- Board extension : RC-86 board (front side)
- Board extension : DIF-102 board (rear side)
- ◓RV354 (B-4)/RC-86 → mechanical center (ENC LEVEL)
- S811-1 (M-6)/RC-86 → ON
- S811-2 (M-6)/RC-86 → OFF
- S802 (M-4)/RC-86 → 525
- PIX monitor select switch/MSU → ENC
- BARS button/MSU → ON

Adjustment Procedure

1. Video level adjustment
   Measuring point : TP351 (A-5)/RC-86
   Adjusting point : ◓RV351 (B-5)/RC-86
   Specifications : A = 1428 ±5 mV



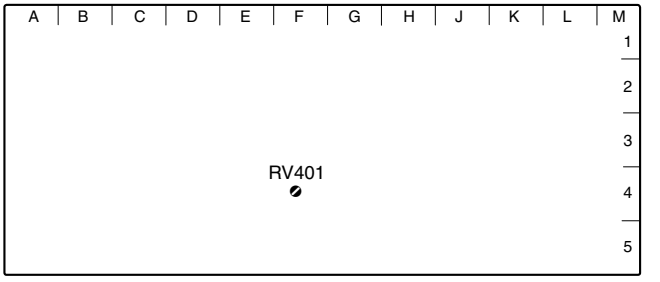
2. PIX OUT level adjustment
   Measuring point : PIX OUT connector/DIF-102
   Adjusting point : ◓RV401 (F-4)/DIF-102
   Specifications : B = 100.0 ±0.5 IRE
   (terminated at 75 Ω) (for UC)
   B = 700.0 ±3.5 mV
   (terminated at 75 Ω) (for CE)

Settings after Adjustment

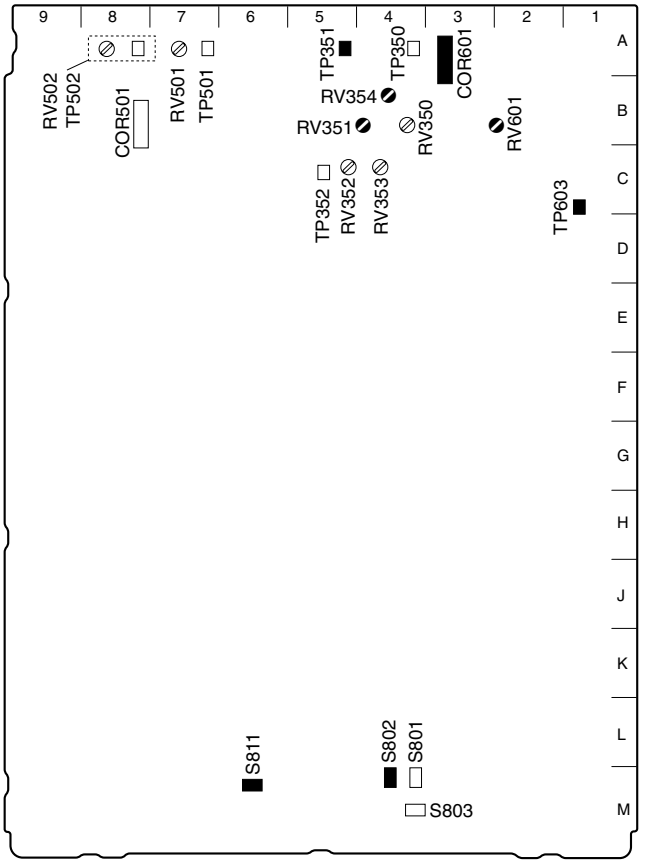
- After finishing the adjustment, return the switches to the original setting.
- PIX monitor select switch/MSU → ENC
- BARS button/MSU → ON

Note

Do not move ◓RV354 (B-4) on the RC-86 board from the mechanical center.



DIF-102 board (A side)



RC-86 board (A side)

3-4-4. WF Output Level Adjustment

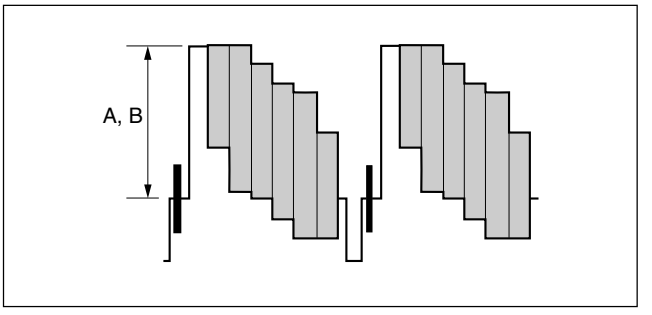
Measures : Oscilloscope, SD waveform monitor

Preparation

- Board extension : RC-86 board (front side)
- Board extension : DIF-102 board (rear side)
- ⊘RV354 (B-4)/RC-86 → mechanical center (ENC LEVEL)
- S811-1 (M-6)/RC-86 → ON
- S811-2 (M-6)/RC-86 → OFF
- S802 (M-4)/RC-86 → 525
- WF monitor select switch/MSU → ENC
- BARS button/MSU → ON

Adjustment Procedure

1. Video level adjustment
   Measuring point : TP350 (A-4)/RC-86
   Adjusting point : ⊘RV350 (B-4)/RC-86
   Specifications : A = 1428 ±5 mV



2. WF OUT level adjustment
   Measuring point : WF OUT connector/DIF-102
   Adjusting point : ⊘RV404 (G-4)/DIF-102
   Specifications : B = 100.0 ±0.5 IRE
   (terminated at 75 Ω) (for UC)
   B = 700.0 ±3.5 mV
   (terminated at 75 Ω) (for CE)

Settings after Adjustment

- After finishing the adjustment, return the switches to the original setting.
- WF monitor select switch/MSU → ENC
- BARS button/MSU → OFF

Note

Do not move ⊘RV354 (B-4) on the RC-86 board from the mechanical center.

3-4-5. STAIR CASE Adjustment

Measure : Oscilloscope

Note

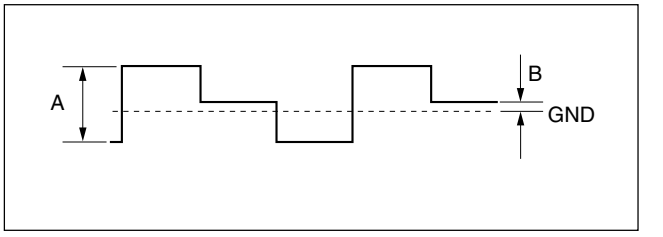
Perform temporarily this adjustment after repairing.
When the system is set up, perform the adjustment again according to the characteristic of the waveform monitor.

Preparation

- Board extension : RC-86 board (front side)
- ⊘RV354 (B-4)/RC-86 → mechanical center (ENC LEVEL)
- S802 (M-4)/RC-86 → 525

Adjustment Procedure

Measuring point : TP352 (C-5)/RC-86
Adjusting point : ⊘RV353 (C-4)/RC-86
⊘RV352 (C-5)/RC-86
Specifications : A = 10.0 ±0.5 V p-p (⊘RV353)
B = 0 ±0.5 V dc (⊘RV352)

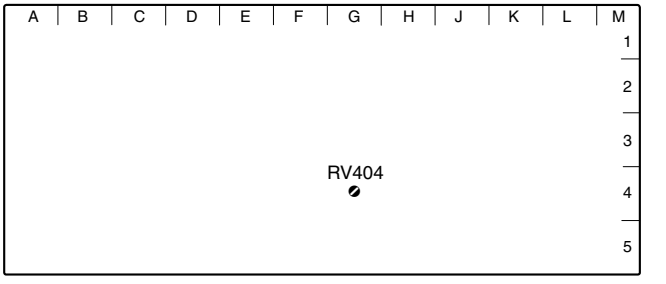


Settings after Adjustment

After finishing the adjustment, return the switches to the original setting.

Note

Do not move ⊘RV354 (B-4) on the RC-86 board from the mechanical center.

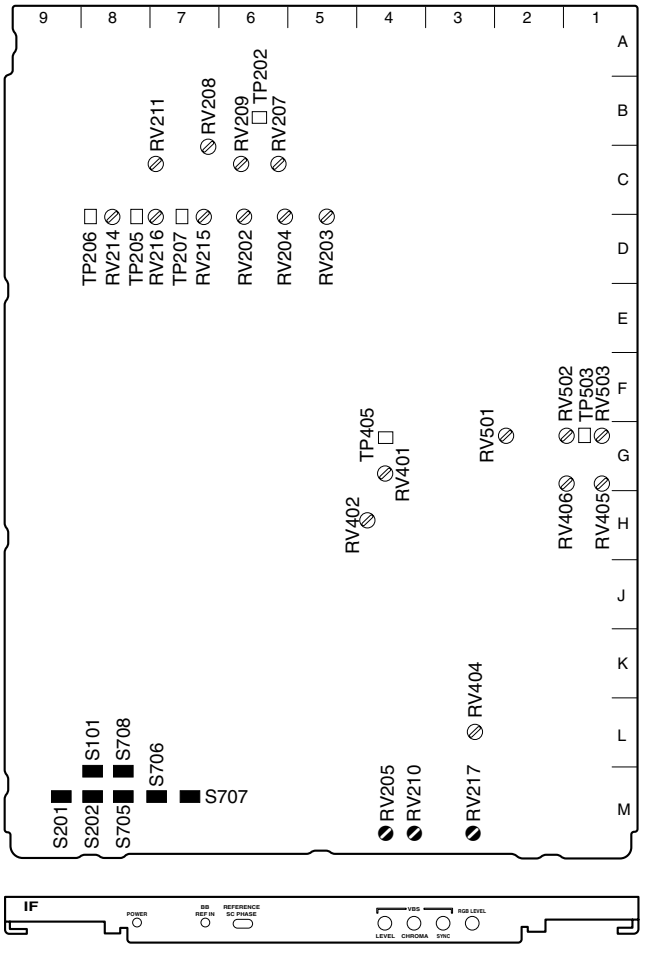


DIF-102 board (A side)

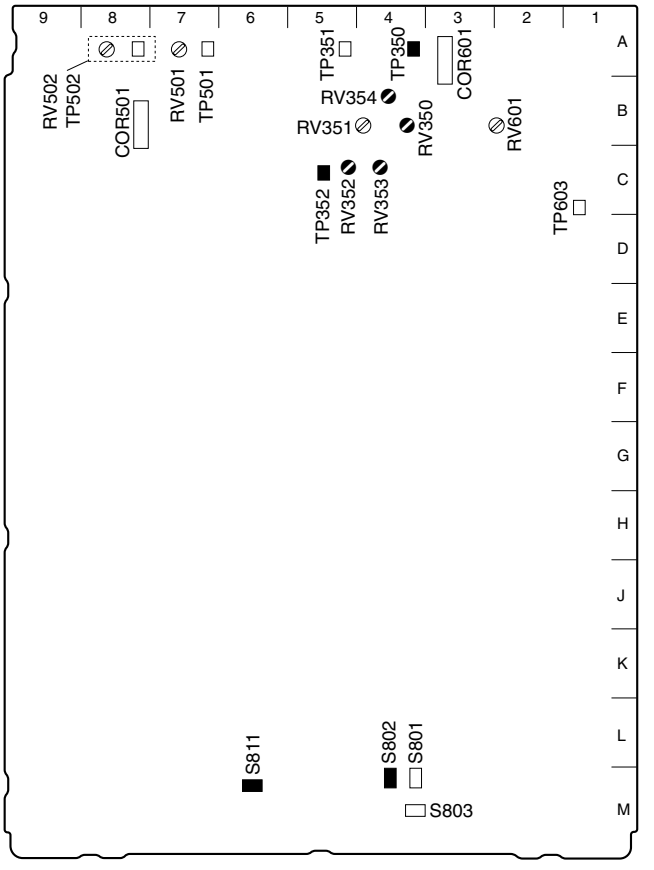
3-5. SD Signal System Adjustment (HKCU-901)

Preparation

- Board extension : IF-789A/789P board (front side)
- S101-1 (M-9)/IF-789A/789P → ON
- S101-2 (M-9)/IF-789A/789P → SMPTE
- S708-1 (M-8)/IF-789A/789P → ON (CLEAR)
- S201 (M-9)/IF-789A/789P → OFF
- S202 (M-8)/IF-789A/789P → ON
- S705 (M-8)/IF-789A/789P → RGB
- S706 (M-8)/IF-789A/789P → 3WAVE
- S707 (M-7)/IF-789A/789P → NG
- ⊘RV205 (VBS LEVEL)/IF-789A/789P board panel side → Mechanical center
- ⊘RV210 (VBS CHROMA)/IF-789A/789P board panel side → Mechanical center
- ⊘RV217 (RGB LEVEL)/IF-789A/789P board panel side → Mechanical center
- BARS button/MSU → ON


9 8 7 6 5 4 3 2 1
A B C D E F G H J K L M
RV211 RV208 RV209 TP202 RV207
TP206 RV214 TP205 RV216 TP207 RV215 RV202 RV204 RV203
TP405 RV401 RV402 RV501 RV502 TP503 RV503 RV406 RV405
S201 S202 S101 S705 S708 S706 S707 RV205 RV210 RV404 RV217
IF
POWER
BB REF IN
REFERENCE SC PHASE
VBS
RGB LEVEL
LEVEL CHROMA SYNC

IF-789A/789P board (A side and panel side)



RC-85 board (A side)

3-5-1. VBS Output Level Adjustment

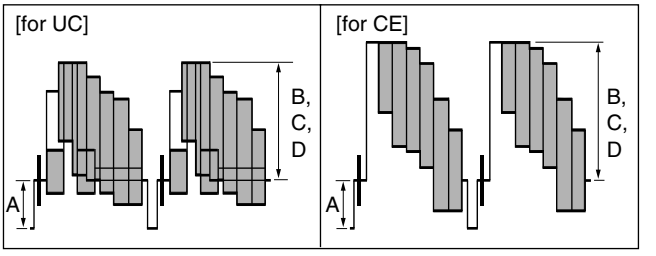
Measures : SD waveform monitor, Vector monitor

Preparation

Board extension : VDA-57 board (rear side)

Adjustment Procedure

1. SYNC level adjustment
   Measuring point : TP202 (B-6)/IF-789A/789P
   Adjusting point : ◓RV209 (C-6)/IF-789A/789P
   Specifications : A = 571 ±3 mV (for UC)
   A = 600 ±3 mV (for CE)



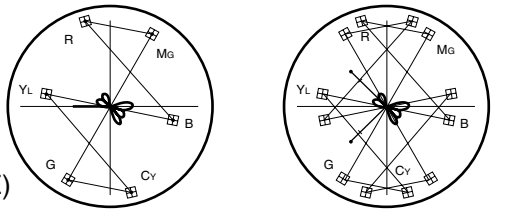
2. Video level adjustment
   Measuring point : TP202 (B-6)/IF-789A/789P
   Adjusting point : ◓RV202 (D-6)/IF-789A/789P
   Specifications : B = 1429 ±5 mV (for UC)
   B = 1400 ±5 mV (for CE)

3. VBS1 OUT level adjustment
   Measuring point : VBS OUT1 connector/VDA-57
   Adjusting point : ◓RV62 (L-5)/VDA-57
   Specifications : C = 100.0 ±0.5 IRE
   (terminated at 75 Ω) (for UC)
   C = 700.0 ±3.5 mV
   (terminated at 75 Ω) (for CE)

4. VBS2 OUT level adjustment
   Measuring point : VBS OUT2 connector/VDA-57
   Adjusting point : ◓RV61 (M-4)/VDA-57
   Specifications : D = 100.0 ±0.5 IRE
   (terminated at 75 Ω) (for UC)
   D = 700.0 ±3.5 mV
   (terminated at 75 Ω) (for CE)

5. Chroma adjustment
   Adjust the PHASE knob of the vector monitor so that 75% of the luminescent spot of the burst is aligned with the axis.
   Measuring point : VBS OUT1 connector/VDA-57
   Adjusting point : ◓RV208 (C-7)/IF-789A/789P
   Specifications : The luminescent spot should be located inside "⊞".

[for UC] [for CE]



3-5-2. PIX Output Level Adjustment

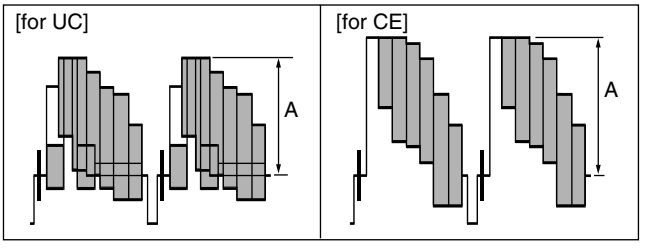
Measure : SD waveform monitor

Preparation

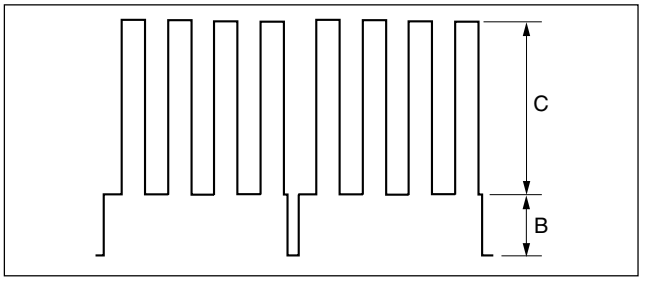
- The VBS output level adjustment (section 3-5-2) should be completed.
- PIX monitor select switch/MSU → ENC
- Board extension : VDA-57 board (rear side)

Adjustment Procedure

1. PIX signal level adjustment
   Measuring point : PIX OUT connector/VDA-57
   Adjusting point : ◓RV121 (F-5)/VDA-57
   Specifications : A = 100.0 ±0.5 IRE
   (terminated at 75 Ω) (for UC)
   A = 700 ±3.5 mV
   (terminated at 75 Ω) (for CE)



2. PIX monitor select switch/MSU → R, G or B
3. SYNC level adjustment
   Measuring point: PIX OUT connector/VDA-57
   Adjusting point: ◓RV207 (C-6)/IF-789A/789P
   Specifications: B = 40.0 ±0.5 IRE
   (terminated at 75 Ω) (for UC)
   B = 300.0 ±3.5 mV
   (terminated at 75 Ω) (for CE)



4. Video level adjustment
   Measuring point : PIX OUT connector/VDA-57
   Adjusting point : ◓RV204 (D-6)/IF-789A/789P
   Specifications : C = 75.0 ±0.5 IRE
   (terminated at 75 Ω) (for UC)
   C = 525.0 ±3.5 mV
   (terminated at 75 Ω) (for CE)

Setting after Adjustment

PIX monitor select switch/MSU → ENC

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3-5-3. WF Output Level Adjustment

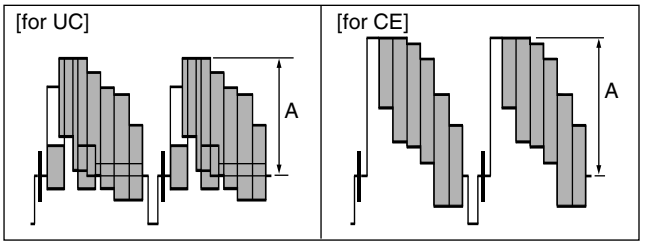
Measure : SD waveform monitor

Preparation

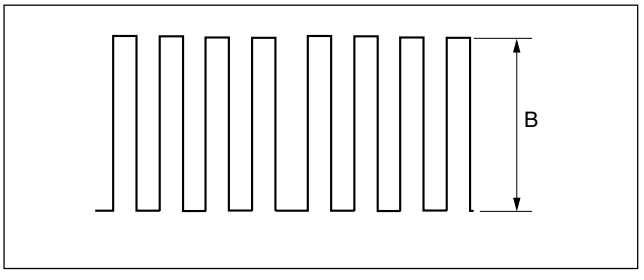
- The VBS output level adjustment (section 3-5-2) should be completed.
- WF monitor select switch/MSU → ENC
- Board extension : VDA-57 board (rear side)

Adjustment Procedure

1. WF signal level adjustment
   Measuring point : WF OUT connector/VDA-57
   Adjusting point : ◓RV124 (G-5)/VDA-57
   Specifications : A = 100.0 ±0.5 IRE
   (terminated at 75 Ω) (for UC)
   A = 700.0 ±3.5 mV
   (terminated at 75 Ω) (for CE)

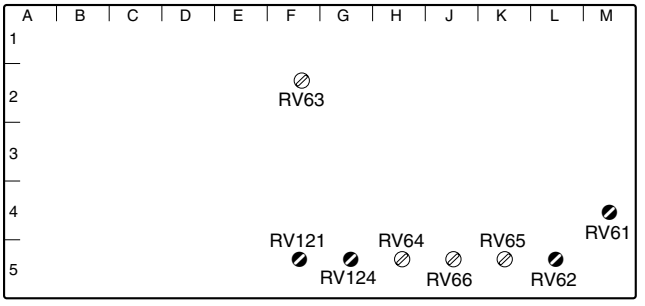


2. WF monitor select switch/MSU → B
3. Video level adjustment
   Measuring point : WF OUT connector/VDA-57
   Adjusting point : ◓RV203 (D-5)/IF-789A/789P
   Specifications : B = 75 ±1 IRE
   (terminated at 75 Ω) (for UC)
   B = 525 ±7 mV p-p
   (terminated at 75 Ω) (for CE)

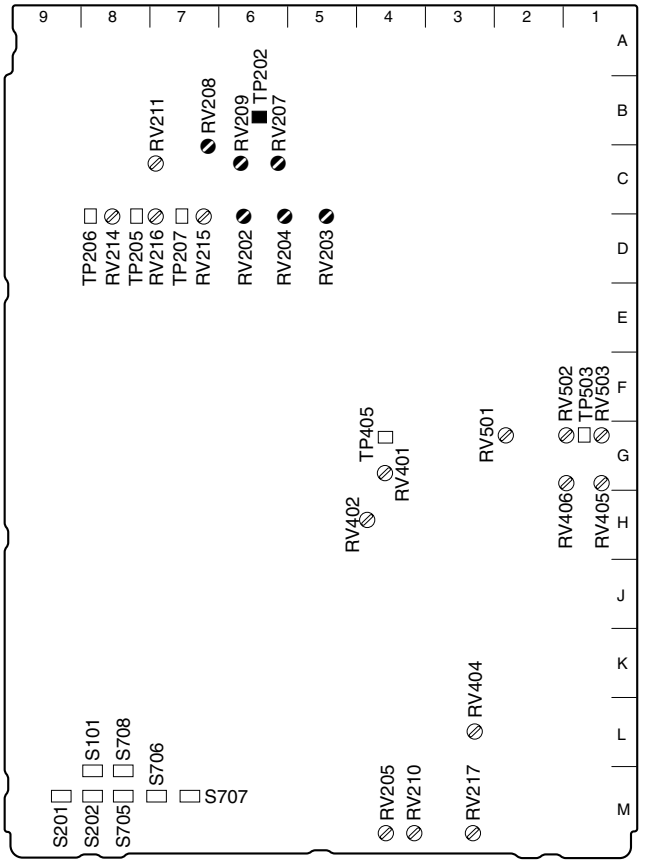


Setting after Adjustment

WF monitor select switch/MSU → ENC



VDA-57 board (A side)



IF-789A/789P board (A side)

3-5-4. GRB Output Level Adjustment

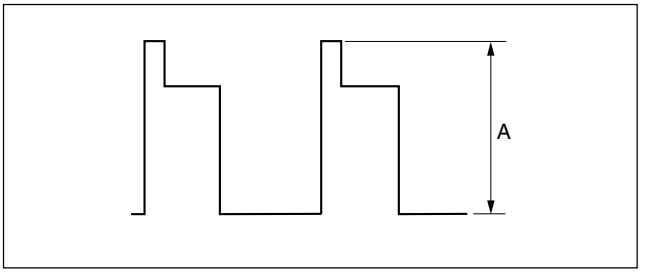
Measure : SD waveform monitor

Preparation

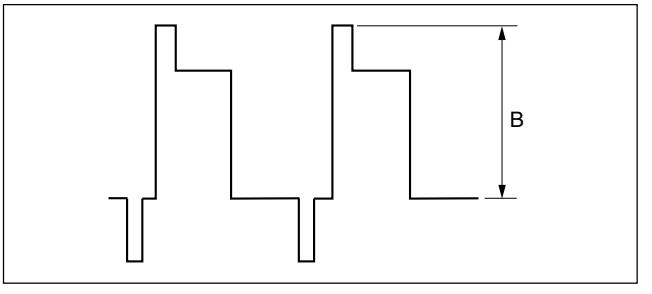
Board extension : VDA-57 board (rear side)

Adjustment Procedure

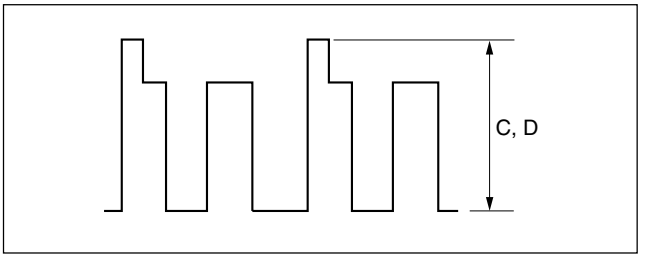
1. G signal level adjustment-1
   Measuring point : TP205 (D-8)/IF-789A/789P
   Adjusting point : ⊘RV216 (D-7)/IF-789A/789P
   Specifications : A = 1000 ±5 mV p-p
   (terminated at 75 Ω) (100% color bar)



2. G signal level adjustment-2
   Measuring point : Y/G OUTPUT connector/VDA-57
   Adjusting point : ⊘RV64 (H-5)/VDA-57
   Specifications : B = 700 ±5 mV
   (terminated at 75 Ω)

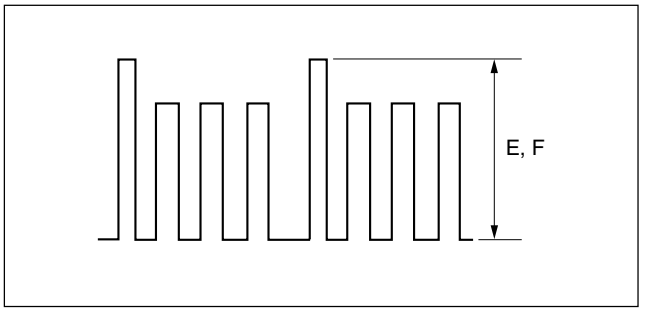


3. R signal level adjustment-1
   Measuring point : TP207 (D-7)/IF-789A/789P
   Adjusting point : ⊘RV215 (D-7)/IF-789A/789P
   Specifications : C = 1000 ±5 mV p-p
   (100% color bar)



4. R signal level adjustment-2
   Measuring point : R-Y/R OUTPUT connector/VDA-57
   Adjusting point : ⊘RV65 (K-5)/VDA-57
   Specifications : D = 700 ±5 mV p-p
   (terminated at 75 Ω)

5. B signal level adjustment-1
   Measuring point : TP206 (D-8)/IF-789A/789P
   Adjusting point : ⊘RV214 (D-8)/IF-789A/789P
   Specifications : E = 1000 ±5 mV p-p
   (100% color bar)



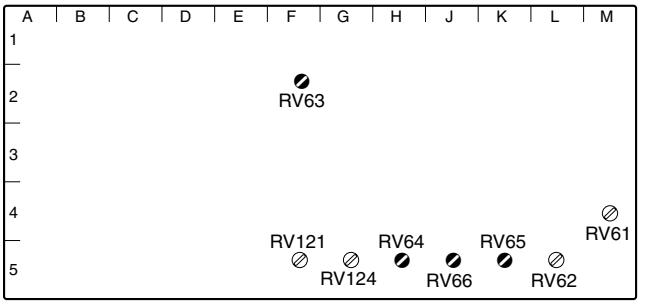
6. B signal level adjustment-2
   Measuring point : B-Y/B OUTPUT connector/VDA-57
   Adjusting point : ⊘RV66 (J-5)/VDA-57
   Specifications : F = 700 ±5 mV p-p
   (terminated at 75 Ω)

3-5-5. Y/R-Y/B-Y Output Level Adjustment

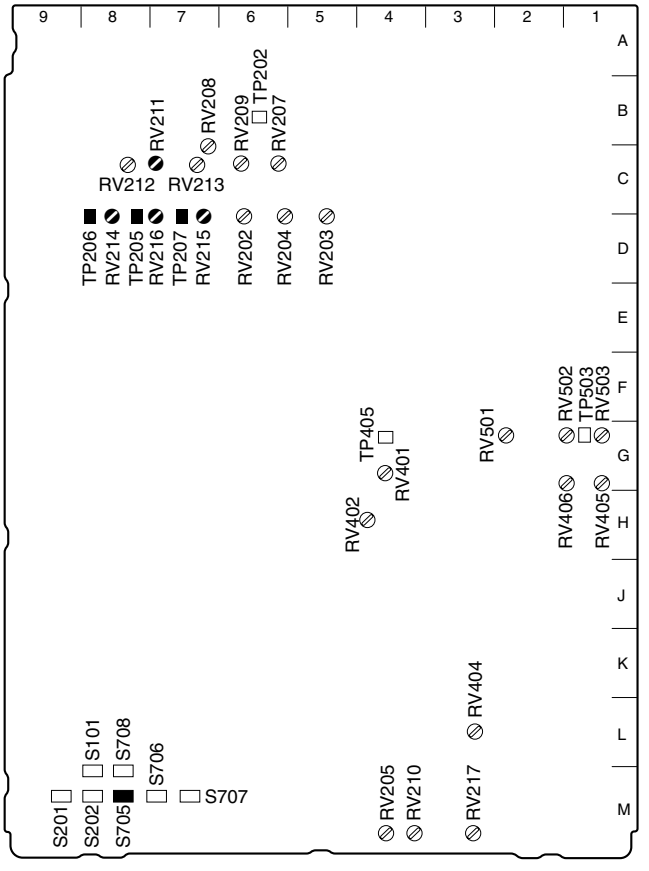
Measure : SD waveform monitor

Preparation

- The GRB output level adjustment (section 3-5-4) should be completed.
- Board extension : VDA-57 board (rear side)
- S705 (M-8)/IF-789A/789P → YCD
- S201 (M-8)/IF-789A/789P → OFF



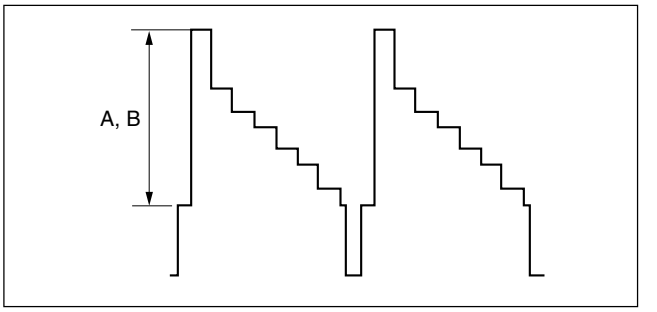
VDA-57 board (A side)



IF-789A/789P board (A side)

Adjustment Procedure

1. Measuring point : Y/G OUTPUT connector/VDA-57
   Measure level A. (about 100 IRE or 700 mV (terminated at 75 Ω))
   (100% (Y) color bar)

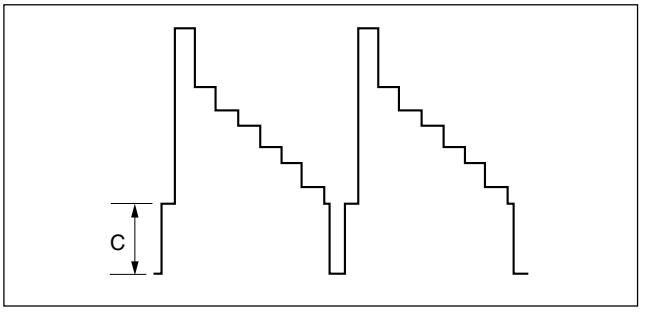


2. S201 (M-8)/IF-789A/789P → ON
3. Y signal level adjustment
   Measuring point : Y/G OUTPUT conenctor/VDA-57
   Adjusting point : ◓RV211 (C-7)/IF-789A/789P
   Specifications : B = A (terminated at 75 Ω)
   (100% color bar)

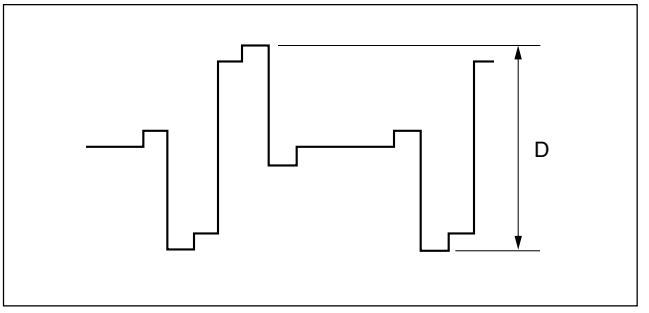
   Note

   When turning ON S201 (M-8) on the IF-789A/789P (with SET UP added) and turning off (when SET UP is not added), the level of A and B should not be changed.

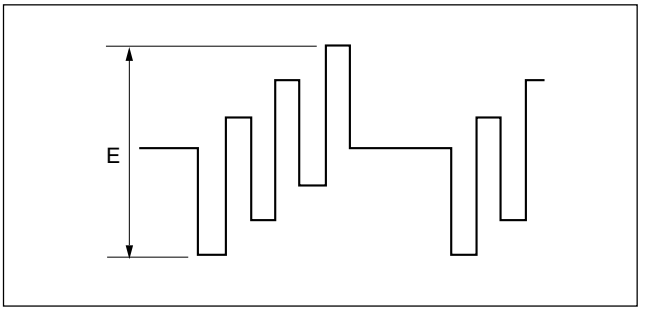
4. SYNC level adjustment
   Measuring point : Y/G OUTPUT connector/VDA-57
   Adjusting point : ◓RV63 (F-2)/VDA-57
   Specifications : C = 40 ±2 IRE
   (terminated at 75 Ω)
   (100% (Y) color bar) (for UC)
   C = 300 ±14 mV
   (terminated at 75 Ω)
   (100% (Y) color bar) (for CE)



5. R-Y signal level adjustment
   Measuring point : R-Y/R OUTPUT connector/VDA-57
   Adjusting point : ◓RV213 (C-7)/IF-789A/789P
   Specifications : D = 700 ±5 mV p-p (SET UP : ON)
   (75% (R-Y) color bar) (for UC)
   D = 525 ±5 mV p-p
   (75% (R-Y) color bar) (for CE)



6. B-Y signal level adjustment
   Measuring point : B-Y/B OUTPUT connector/VDA-57
   Adjusting point : ◓RV212 (C-8)/IF-789A/789P
   Specifications : E = 700 ±5 mV p-p (SET UP : ON)
   (75% (B-Y) color bar) (for UC)
   E = 525 ±5 mV p-p
   (75% (B-Y) color bar) (for CE)

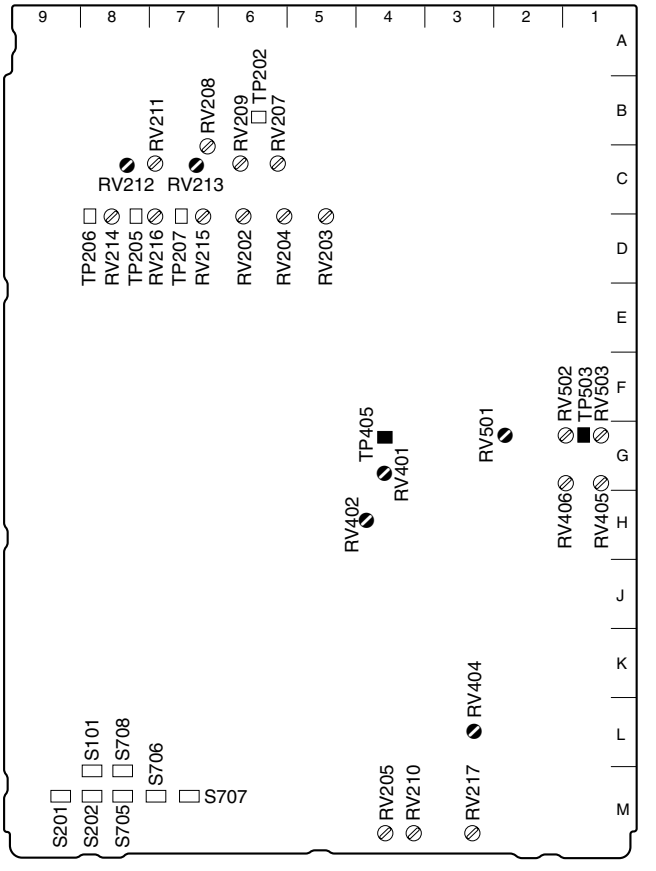


3-5-6. Return Level Adjustment

Measure : Oscilloscope

Preparation

- Board extension: IF-789A/789P board (front side)
- Board extension: VDA-55 board (CAMERA side)
- Connect the VBS OUT1 connector on the VDA-57 board and the RET INPUT1 connector on the VDA-57.
- Connect the SERIAL OUTPUT1 connector on the DIF-102 board and the SERIAL RET INPUT1 connector on the DIF-102 board.
- S811-1, 2 (M-6)/RC-86 → ON

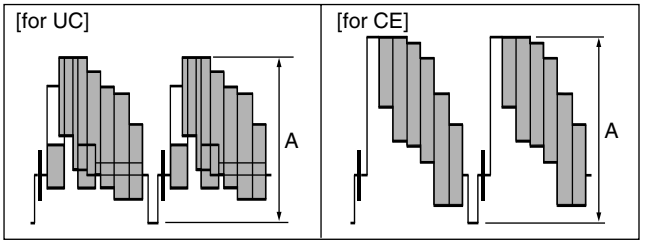


IF-789A/789P board (A side)

1. Input Level Adjustment

Adjustment Procedure

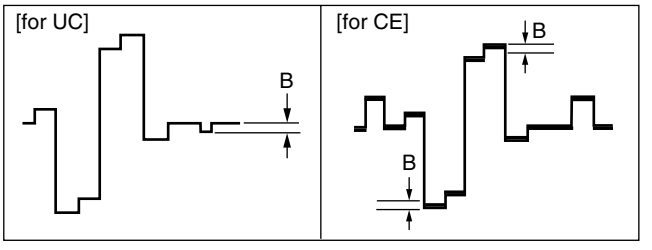
Measuring point : TP405 (G-4)/IF-789A/789P
Adjusting point : ⊘RV401 (G-4)/IF-789A/789P
Specifications : A = 1.56 ±0.02 V p-p



2. Phase Adjustment

Adjustment Procedure

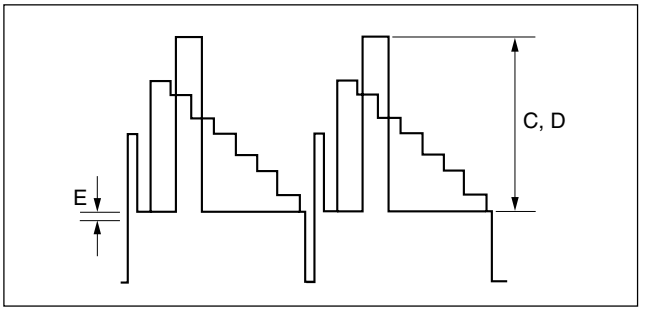
Measuring point : TP503 (G-1)/IF-789A/789P
Adjusting point : ⊘RV404 (L-3)/IF-789A/789P
Specifications : B = 0



3. Return Level Adjustment (Y)

Adjustment Procedure

1. CONFIG button/MSU → ON
   Set using MSU on the touch panel as follows.
   CCU → RET SETTING → RET1 : 2nd Slot (DIF-RET-1)



2. Measuring point : TP37/extension board (VDA-55)
   Measure level C. (about 1400 mV)

3. CONFIG button/MSU → ON
   Set using MSU on the touch panel as follows.
   CCU → RET SETTING → RET1 : 3rd Slot (VDA-RET-1)

4. Measuring point : TP37/extension board (VDA-55)
   Adjusting point : ⊘RV402 (H-4)/IF-789A/789P
   Specifications : D = C

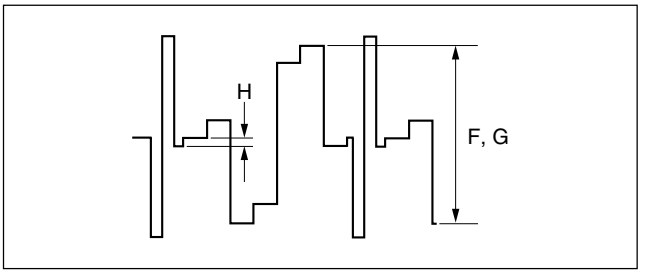
5. Measuring point : TP37/extension board (VDA-55)
   Adjusting point : ⊘RV501 (G-2)/IF-789A/789P
   Specifications : E = 0

6. Repeat steps 4 and 5 until the specifications are satisfied.

4. Return Level Adjustment (Pr)

Adjustment Procedure

1. CONFIG button/MSU → ON
   Set using MSU on the touch panel as follows.
   CCU → RET SETTING → RET1 : 2nd Slot (DIF-RET-1)



2. Measuring point : TP31/extension board (VDA-55)
   Measure level F. (about 1050 mV)

3. CONFIG button/MSU → ON
   Set using MSU on the touch panel as follows.
   CCU → RET SETTING → RET1 : 3rd Slot (VDA-RET-1)

4. Measuring point : TP31/extension board (VDA-55)
   Adjusting point : ◓RV405 (G-1)/IF-789A/789P
   Specifications : G = F

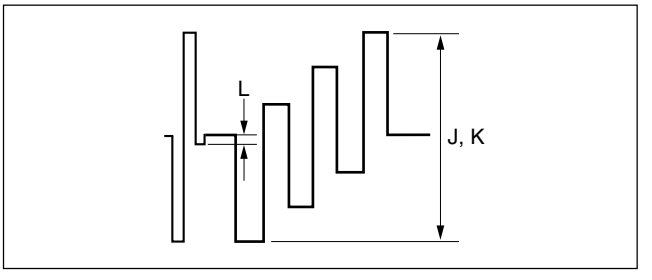
5. Measuring point : TP31/extension board (VDA-55)
   Adjusting point: ◓RV503 (G-1)/IF-789A/789P
   Specifications : H = 0

6. Repeat steps 4 and 5 until the specifications are satisfied.

5. Return Level Adjustment (Pb)

Adjustment Procedure

1. CONFIG button/MSU → ON
   Set using MSU on the touch panel as follows.
   CCU → RET SETTING → RET1 : 2nd Slot (DIF-RET-1)



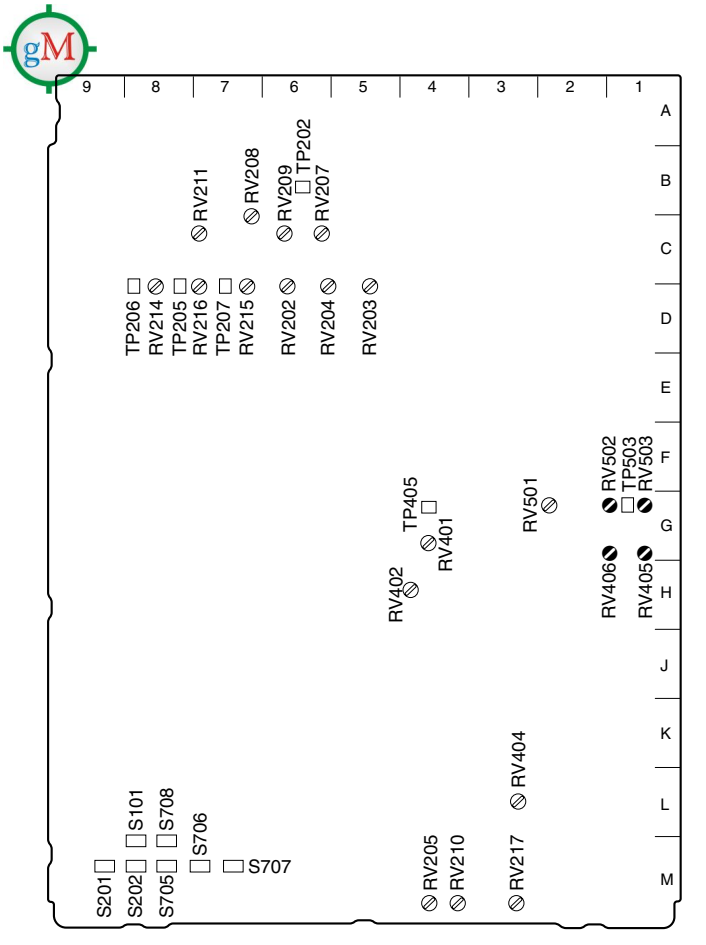
2. Measuring point : TP43/extension board (VDA-55)
   Measure level J. (about 1050 mV)

3. CONFIG button/MSU → ON
   Set using MSU on the touch panel as follows.
   CCU → RET SETTING → RET1 : 3rd Slot (VDA-RET-1)

4. Measuring point : TP43/extension board (VDA-55)
   Adjusting point : ◓RV406 (G-1)/IF-789A/789P
   Specifications : K = J

5. Measuring point : TP43/extension board (VDA-55)
   Adjusting point : ◓RV502 (G-1)/IF-789A/789P
   Specifications : L = 0

6. Repeat steps 4 and 5 until the specifications are satisfied.



IF-789A/789P board (A side)

3-6. HD Signal Input/Output Adjustment (HKCU-902)

3-6-1. Y/P_B/P_R Output Level Adjustment

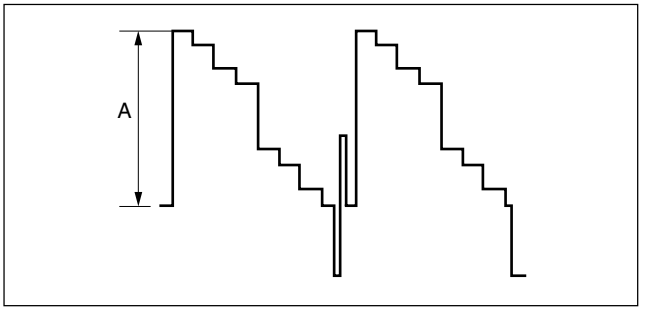
Measure : HD waveform monitor

Preparation

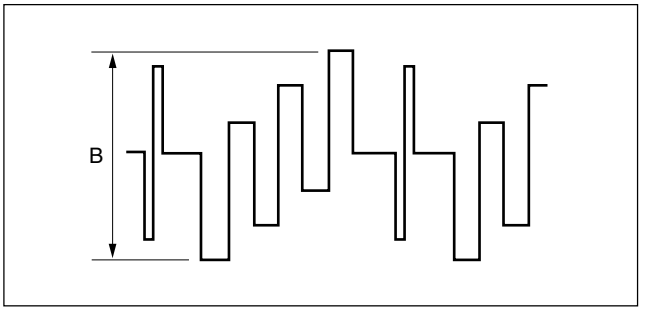
- Board extension : ADA-59 board (rear side)
- BARS button/MSU → ON
- S1 (F-2)/ADA-59 → C

Adjustment Procedure

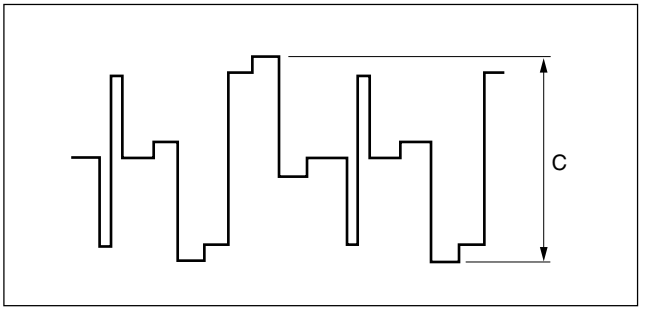
1. Y output level adjustment
   Measuring point : Y/G OUTPUT1 connector/ADA-59
   Adjusting point : ⊘RV101 (G-3)/ADA-59
   Specifications : A = 700 ±5 mV
   (terminated at 75 Ω)



2. P_B output level adjustment
   Measuring point : P_B/B OUTPUT1 connector/ADA-59
   Adjusting point : ⊘RV201 (H-2)/ADA-59
   Specifications : A = 700 ±5 mV p-p
   (terminated at 75 Ω)

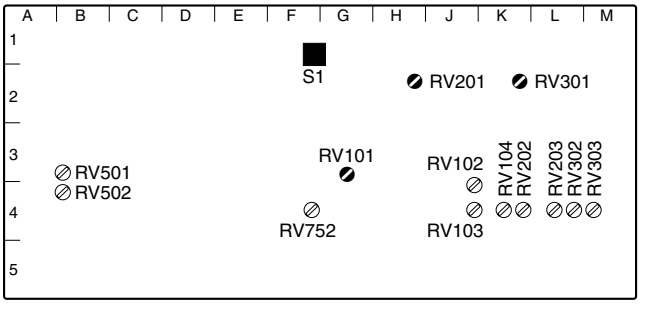


3. P_R output level adjustment
   Measuring point : P_R/R OUTPUT1 connector/ADA-59
   Adjusting point : ⊘RV301 (K-2)/ADA-59
   Specifications : C = 700 ±5 mV p-p
   (terminated at 75 Ω)



Setting after Adjustment

- S1 (F-2)/ADA-59 → 0
- BARS button/MSU → OFF



ADA-59 board (A side)

3-6-2. GBR Output Level Adjustment

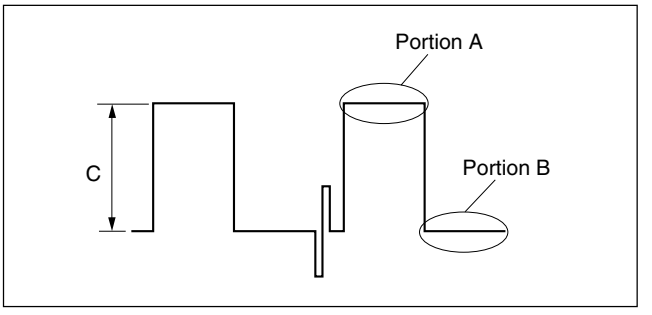
Measure : HD waveform monitor

Preparation

- The Y/P_B/P_R output level adjustment (section 3-6-1) should be completed.
- Board extension : ADA-59 board (rear side)
- S1 (F-2)/ADA-59 → 8
- BARS button/MSU → ON

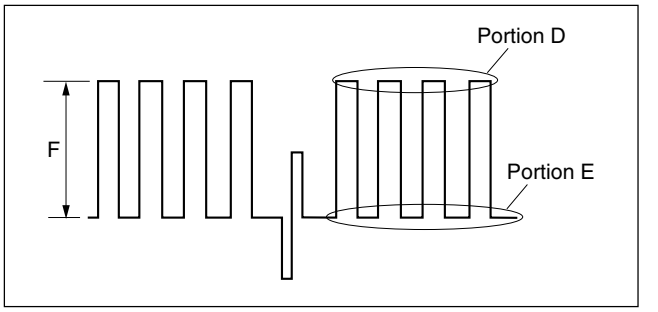
Adjustment Procedure

1. G mix level adjustment
   Measuring point : Y/G OUTPUT1 connector/ ADA-59
   Adjusting point : ⊘RV102 (J-4)/ADA-59
   ⊘RV103 (J-4)/ADA-59
   Specifications : Portion A and portion B must be flat (within 5 mV).



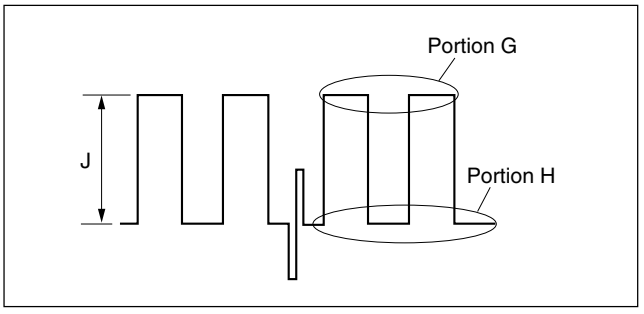
2. G signal level adjustment
   Measuring point : Y/G OUTPUT1 connector/ADA-59
   Adjusting point : ⊘RV104 (K-4)/ADA-59
   Specifications : C = 700 ±5 mV
   (terminated at 75 Ω)

3. B mix level adjustment
   Measuring point : P_B/B OUTPUT1 connector/ADA-59
   Adjusting point : ⊘RV202 (K-4)/ADA-59
   Specifications : Portion D and portion E must be flat (within 5 mV).



4. B signal level adjustment
   Measuring point : P_B/B OUTPUT1 connector/ADA-59
   Adjusting point : ⊘RV203 (L-4)/ADA-59
   Specifications : F = 700 ±5 mV

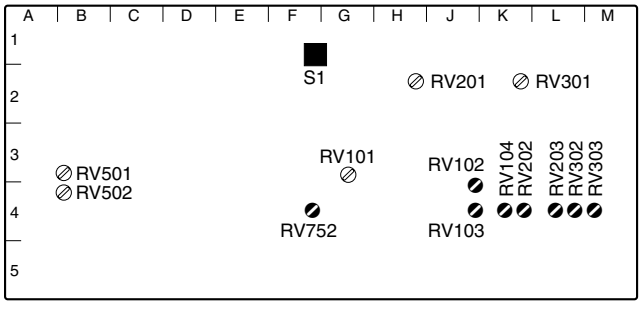
5. R mix level adjustment
   Measuring point : P_R/R OUTPUT1 connector/ ADA-59
   Adjusting point : ⊘RV302 (L-4)/ADA-59
   Specifications : Portion G and portion H must be flat (within 5 mV or less).



6. R signal level adjustment
   Measuring point : P_R/B OUTPUT1 connector/ADA-59
   Adjusting point : ⊘RV303 (M-4)/ADA-59
   Specifications : J = 700 ±5 mV (terminated at 75 Ω)

Setting after Adjustment

- S1 (F-2)/ADA-59 → 0
- BARS button/MSU → OFF



ADA-59 board (A side)

3-6-3. SYNC Output Level Adjustment

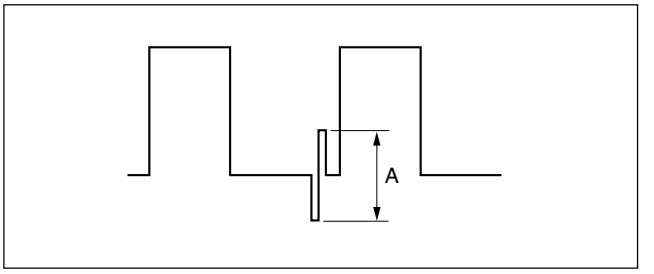
Measure : HD waveform monitor

Preparation

- Board extension : ADA-59 board (rear side)
- BARS button/MSU → ON

Adjustment Procedure

Measuring point : Y/G OUTPUT1 connector/ADA-59
Adjusting point : ⊘RV752 (F-4)/ADA-59
Specifications : A = 600 ±5 mV (terminated at 75 Ω)



Setting after Adjustment

BARS button/MSU → OFF

3-6-4. A/D Conversion Level Adjustment

Measure : Oscilloscope

Note

Do not connect anything to the VTR connector of the camera.

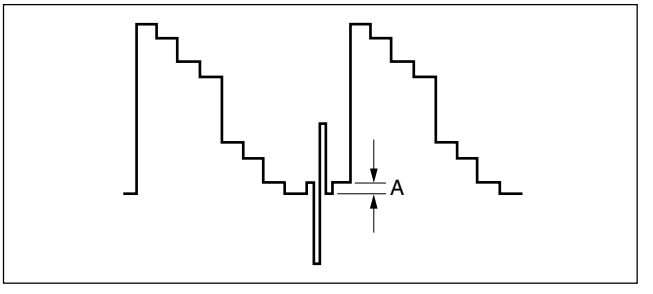
Preparation

- Board extension : VDA-55 board (HDC-900/950)
- Board extension : ADA-59 board (rear side)
- Connect the Y/G OUTPUT1 connector on the ADA-59 and the RET INPUT1 connector on the ADA-59.
- S1 (F-2)/ADA-59 → C
- BARS button/MSU → ON
- Set on the setup menu of the HDC-900/950 as follows.
  TOP MENU : MAINTENANCE
  PAGE : VTR-26P (M9)
  ITEM : VIDEO SEL → RET (YPbPr)

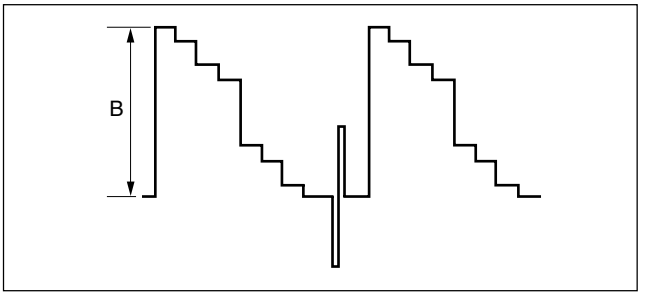
- RET1 button/camera → ON

Adjustment Procedure

1. Measuring point : TP37/extension board (VDA-55)
   Adjusting point : ⊘RV501 (B-3)/ADA-59
   Specifications : A = 0 ±5 mV

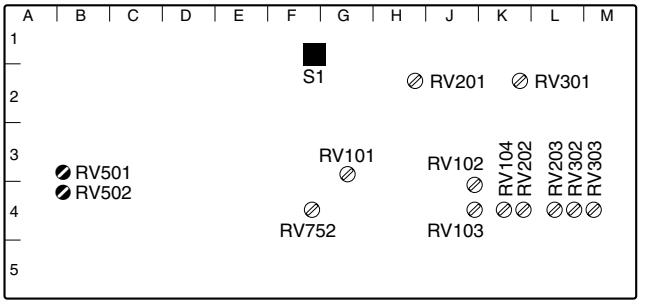


2. Measuring point : TP37/extension board (VDA-55)
   Adjusting point : ⊘RV502 (B-4)/ADA-59
   Specifications : B = 1400 ±1 0 mV



Setting after Adjustment

- S1 (F-2)/ADA-59 → 0
- Return the setting on the setup menu of the HDC-900/950.
- RET1 button/camera → Return to the original setting.
- BARS button/MSU → OFF



ADA-59 board (A side)

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